A.1.5. 議事録 (プロジェクトの延長：2012年1月26日)

MINUTES OF MEETING
BETWEEN
JAPAN INTERNATINAL COOPERATION AGENCY
AND
THE AUTHORITIES CONCERNED OF THE REPUBLIC OF CUBA
ON
THE EXTENSION OF THE JAPANESE TECHNICAL COOPERATION PROJECT FOR IMPROVEMENT OF CAPACITY ON SOLID WASTE MANAGEMENT IN HAVANA CITY

With regard to the extension of the Japanese technical cooperation project for Improvement of Capacity on Solid Waste Management in Havana City (hereinafter referred to as 'the Project') based on the Record of Discussion signed on May 18th, 2009, Japan International Cooperation Agency (hereinafter referred to as 'JICA') held series of discussion with the authorities concerned of the Republic of Cuba in accordance with the recommendation of the Mid-term evaluation conducted in October 2011.

As a result of the discussion, both sides agreed to recommend to their respective Governments the modification of the Project period for the Project in conformity with the lines described in the document attached hereto.

These texts are prepared in two versions. The main version is written in English and the other version is written in Spanish, each version being equally authentic. In case of any divergence of interpretation, the English version shall prevail.

Havana, 26th of January, 2012

Mr. Rigoberto Enoa Novo
Director of the
Economic Policy in charge of
Asian and Oceanian Affairs,
Ministry of Foreign Trade and
Foreign Investment
Republic of Cuba

Mr. Norio Yonezaki
Senior Representative,
Mexico Office
Japan International Cooperation
Agency

Dr. Roberto Castellanos Pérez
Delegate of Ministry of Science,
Technology and
Environment in Havana City
(CITMA-Havana)

Mr. José Carlos Batista
Director
Provincial Direction of Communal
Services
Havana City

THE ATTACHED DOCUMENT

1. Background

The Mid-term Evaluation for the Project was carried out in October 2011. Through the evaluation, Cuban side requested JICA to extend the Project period and the extension of the Project period was also recommended by the evaluation team. The detailed result of the evaluation is described in the evaluation report which is attached to the Minute of Meetings signed on 7 October 2011.

2. Request at the Mid-term evaluation and the responses

(1) Japanese side's request to Cuban side

1) Acquisition of approval for land use diversion for the purpose of the compost pilot project
2) Acquisition of number plate of donated truck for the compost pilot project and an acceleration of procurement of motor which is attached to a crusher machine
3) Installment of donated equipment
4) Consideration of implementation of counterpart training in Japan
5) Remaining counterparts in their jobs to avoid further negative impact on the project implementation

In response to the requests, Cuban side dealt with those matters as follows;

1) The approval was acquired on October 28, 2011 and the land is now used for the pilot project. The necessary construction and the construction will finish by 15 February 2012.
2) The number plate was acquired in October 20, 2011 and the truck is now used for collecting organic waste. A motor for the crusher machine was procured by Cuban side and now installed to crush organic waste. The crusher machine will be in operation provisionally by 15 February 2012 until the motor is replaced by new motor which will be procured by 31 March 2012 at the latest.
3) All equipment are installed other than electric chain block. The first chain block will be installed by 15 February 2012. The second chain block will be installed by 31 March 2012.
4) Cuban side will implement necessary procedure to carry out training for Cuban counterparts in Japan or third countries when Cuban side receives the training program.
5) Cuban side guarantees the stable allocation of Cuban counterparts to the Project. When there are any changes, necessary countermeasures for the change will be carried out. Revised counterparts list is attached as Annex II.

JICA confirmed that main requests were responded appropriately by Cuban

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side. Then, JICA decided to extend the project period as specified in following articles.

(2) Cuban side's request to Japanese side other than the extension of the Project period

1) Technical assistance for newly build transfer station
2) Technical assistance for introduction and maintenance of a truck scale and provision of necessary equipment
3) Technical assistance for the design of access road to landfill

In response to the requests, Japanese side dealt with those matters as follows;

JICA experts will provide necessary technical advice for those matters, including suggestion of appropriate equipment for sanitary landfills. Provision of equipment for the introduction of the truck scale is not included in the Project.

3. Extension of the Project Period

The project period will be extended for nineteen (19) months from February 28th, 2013 to September 30th, 2014.

4. Plan of Operation for the Extension Period

The Project will be implemented in accordance with the Plan of Operation which is given in Annex I.

5. List of equipment

The list of equipment which will be provided in June 2012 is attached as Annex III. Cuban side promised that preparation for the receipt of the equipment and prompt installation upon the provision.

6. Others

All matters other than those mentioned above will be treated in the same manner as prescribed in the Articles of the Record of Discussions signed on May 18th, 2009.

Annex I　Plan of Operation for the Extension Period
Annex II　Organization chart of the Project counterparts
Annex III　List of equipment

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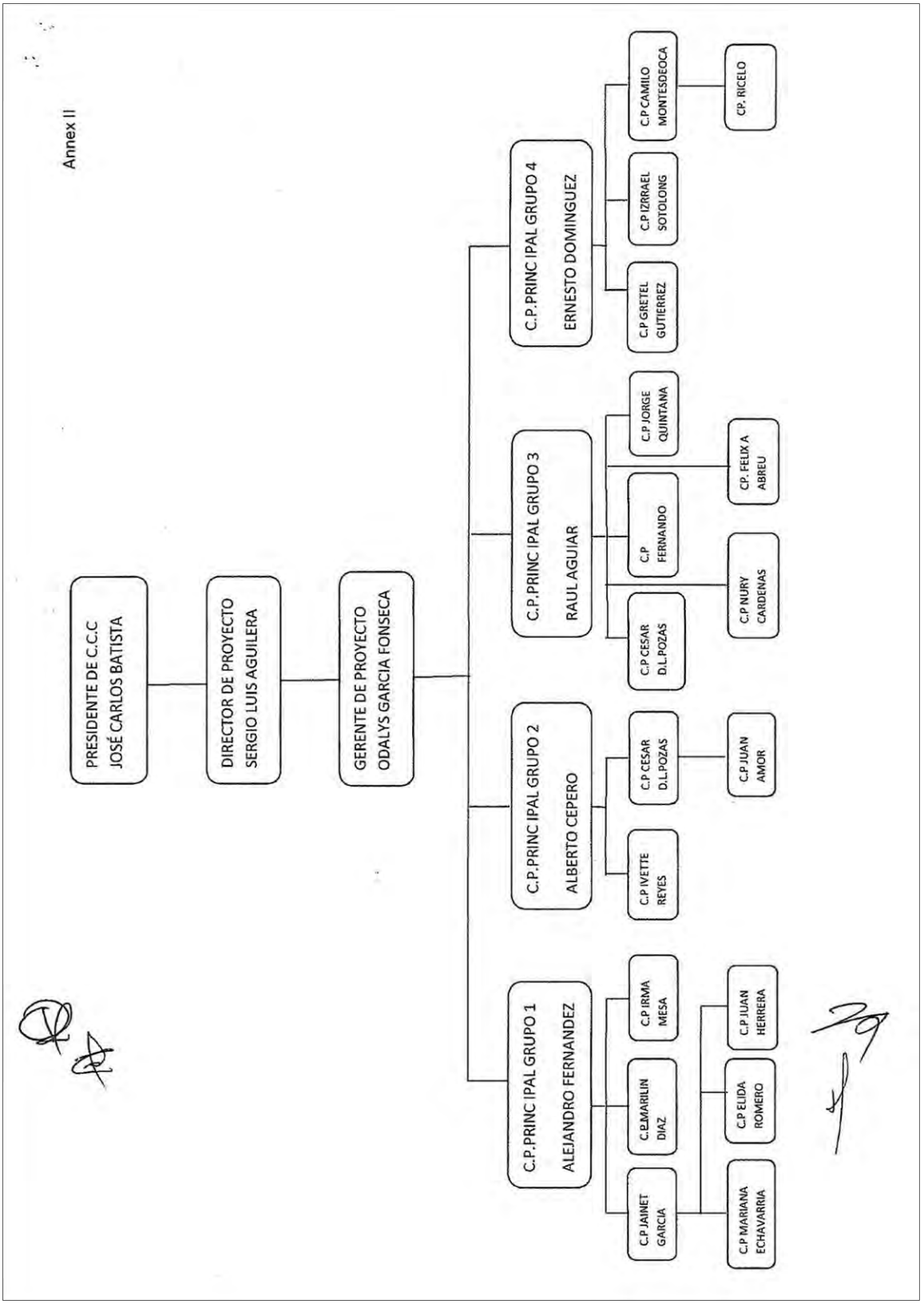

Annex II
PRESIDENTE DE C.C.C
JOSÉ CARLOS BATISTA
DIRECTOR DE PROYECTO
SERGIO LUIS AGUILERA
GERENTE DE PROYECTO
ODALYS GARCIA FONSECA
C.P.PRINC IPAL GRUPO 1
ALEJANDRO FERNANDEZ
C.P.PRINC IPAL GRUPO 2
ALBERTO CEPERO
C.P.PRINC IPAL GRUPO 3
RAUL AGUIAR
C.P.PRINC IPAL GRUPO 4
ERNESTO DOMINGUEZ
C.P JAINET GARCIA
C.P MARIANA ECHAVARRIA
C.P.MARILIN DIAZ
C.P ELIDA ROMERO
C.P IRMA MESA
C.P JUAN HERRERA
C.P IVETTE REYES
C.P CESAR D.L.POZAS
C.P JUAN AMOR
C.P CESAR D.L.POZAS
C.P NURY CARDENAS
C.P FERNANDO
C.P JORGE QUINTANA
C.P FELIX A ABREU
C.P GRETEL GUTIERREZ
C.P IZRRAEL SOTOLONG
C.P CAMILO MONTESDEOCA
CP. RICELO

Project Title: Improvement of the Capacity on Urban Solid Waste Management in Havana, the Republic of Cuba
Implementing Agency: DPSC *including UPPH
Project Site: Havana City　　Pilot Project Site: Miramar Neighborhood in Playa Municipality

project period : 61 months (approximately 5 years)

ANNEX I

modified date : January 26, 2012

Plan of Operation (PO)

Plan of Operation

		1st. year	2nd. year (2010-'11)	3rd. year (2011-'12)	4th. year (2012-'13)	5th. Year (2013 - '14)	6th. Year (2014)	manpower assignment	materials input
		1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12 Mar.	Apr. May Jun. Jul. Aug. Sep. Oct. Nov. Dec. Jan. Feb. Mar.	Apr. May Jun. Jul. Aug. Sep.		
1. Comprehensive management capacity on solid waste of DPSC is improved.									
1.1 Conduct DPSC's capacity assessment according to the Master PLan.	JICA							Chief/Deputy Advisor/Integrated SWM Expert	
	Cuba							Group 1	
1.2 Formulate the Plan of Action to strengthen DPSC's management capacity to plan, monitor, and evaluate the project.	JICA							Chief Advisor/Integrated SWM Expert Deputy Advisor/Integrated SWM Expert	
	Cuba							Group 1	
1.3 Provide on-the-job training to strengthen UPPH's capacity for MSW management.	JICA							Deputy Advisor/Integrated SWM Expert	Training materials
	Cuba							Group 1, 2, 3, 4	
1.4 Prepare the environmental education program on MSW for sanitary workers, local residents, schools, etc.	JICA							Deputy Advisor/Integrated SWM Expert	Training materials
	Cuba							Group 1	
1.5 Implement the program based on Activity 1-4 by introducing composting in schools and other measures.	JICA							Deputy Advisor/Integrated SWM Expert Segregated Waste Collection/Compost Expert	Training materials
	Cuba							Group 1, 2	
1.6 Review and modification of the Master Plan.	JICA							Chief Advisor/Integrated SWM Expert Deputy Advisor/Integrated SWM Expert	
	Cuba							Group 1	
2. Solid waste source separation at Pilot Project Site is promoted and capacity of UPPH in organic waste reduction at the source is strengthened.									
2.1 Take into account the implementation of measures for organic waste reduction. 2.2 Plan the Pilot Project for organic waste composting.	JICA							Segregated Waste Collection/Compost Expert	Container and carrier for compost material
	Cuba							Group 2	
2.3 Implement activities related to the Pilot Project for segregated collection from large-scale generators.	JICA							Segregated Waste Collection/Compost Expert	Container and carrier for compost material
	Cuba							Group 2	
2.4 Implement activities related to the Pilot Project for compost production at the composting yard.	JICA							Segregated Waste Collection/Compost Expert	
	Cuba							Group 2	Facility, electricity & water for community compost
2.5 Evaluate activities related to the Pilot Project.	JICA							Segregated Waste Collection/Compost Expert	
	Cuba							Group 2	
3. Capacity of UPPH in the collection and transportation of solid waste is strengthened.									
3.1 Review the Waste Collection Plan and implement the revised Plan.	JICA							Chief Advisor/Integrated SWM Expert	
	Cuba							Group 3	
3.2 Provide equipment and tools to the collection vehicle maintenance workshop in UPPH.	JICA							Vehicle Maintenance Expert/Machinery Expert	Equipment & tools for maintenance shop
	Cuba							Group 3	Space for equipment & tools, spare parts
3.3 Implement relevant activities to improve the operation of collection vehicles and containers.	JICA							Chief Advisor/Integrated SWM Expert	
	Cuba							Group 3	
3.4 Train UPPH's staff.	JICA							Vehicle Maintenance Expert/Machinery Expert	Training materials
	Cuba							Group 3	
4. Capacity of UPPH and DPSC on landfill design and operation of final disposal site is strengthened.									
4.1 Coordinate vehicle entrance to existing final disposal sites	JICA							Final Disposal Site Expert	
	Cuba							Group 4	Material for truck scale
4.2 Implement relevant activities to improve heavy equipment maintenance.	JICA							Final Disposal Landfill Expert Machinery Expert	Maintenance tools
	Cuba							Group 3, 4	Spare parts
Provide expert advice on design and construction of the new East landfill site.	JICA							Chief Advisor/Integrated SWM Expert Final Disposal Landfill Expert	
	Cuba							Group 4	
4.4 Prepare training materials for the operation and management of the final disposal site, and provide the training.	JICA							Final Disposal Site Expert	Training materials
	Cuba							Group 4	
Joint Coordination Committee		○	○	○	○ Intermediate evaluation ○	○ Ex-post evaluation	○	PR: Progress Report	ICR : Inception Report
Reports		ICR	PR1 PR2 PR3	PR4 PR5	PR6	PR7	DFR FR	DFR: Draft Final Report	
Seminar		●	●	●	●	●	●	FR: Final Report	

Annex III

No.	Location	Equipment	Qtty
1	Taller Central	Hack Sawing Machine	1
2	Taller Central	Hacksaw Blade	24
3	Taller Central	Crimping Machine	1
4	Makina Pesada	Tire Changer	1
5	Taller Central	Service Tools	1
6	Taller Central	Service Tools	1
7	Makina Pesada	Bench Vise	2
8	Makina Pesada	Bench Electric Grinder	1
9	Makina Pesada	Torque Multiplier	1
10	Makina Pesada	Hydraulic Pressure Gauge Set	1
11	Makina Pesada	Chisel & Punch Set	1
12	Taller Central	Screw Pitch Gauge (in)	1
13	Taller Central	Screw Pitch Gauge (mm)	1
14	Taller Central	Tire Changer	1
15	Taller Central	Air Reservoir	1
16	Taller Central	Air Impact Wrench (12.7)	2
17	Taller Central	Air Impact Wrench (19)	2
18	Taller Central	Air Impact Wrench (25,4)	2
19	Taller Central	Air Drilling Machine	2
20	Taller Central	Air Sander	1
21	Taller Central	Hand Grinder	1
22	Taller Central	Garage Jack	1
23	Taller Central	Fuel Injection Pump Tester	1
24	Makina Pesada	Wire Brush	10
25	Taller Central	Hydraulic Press Machine	1
26	Taller Central	Air Compressor	1
27	Taller Central	Wheel Dolly	1

A.1.6.　議事録 (第4回合同調整委員会：2012年1月21日)

MINUTES
OF
THE FOURTH JOINT COORDINATING COMMITTEE
FOR
THE PROJECT FOR IMPROVEMENT OF CAPACITY ON
SOLID WASTE MANAGEMENT IN HAVANA CITY,THE REPUBLIC OF CUBA

The Fourth Joint Coordinating Committee of the Project for Improvement of Capacity on Solid Waste Management in Havana City, the Republic of Cuba (hereinafter referred to as "the Project") was held under the chairmanship of Mr. José Carlos Batista Roca, Director, Provincial Direction of Communal Services (hereinafter referred as"DPSC") and in the presence of the Team of Experts from the Japan International Cooperation Agency (hereinafter referred as JICA) and representative from JICA Mexico and other participants mentioned in the list of participants of this minutes.

Both the Cuban authorities concerned and the JICA Expert Team (hereinafter referred to as "JET") agreed to make this Minutes of Meeting, in order to confirm the mutual understandings reached through the discussion as attached hereto.

The Minutes of Meetings were written in Spanish and English languages, each text being equally authentic. In case of any divergence of interpretation, the English text shall prevail.

Havana City,21June2012

Mr. Kihachiro Urushibata
Chief Adviser,
JICA Expert Team (JET)

Mr. José Carlos Batista Roca, Project Director
Director,
Provincial Direction of Communal Services in
Havana City (DPSC-Havana)
Republic of Cuba

Mr. Naoki Kamijo
Resident Representative of JICA in
Mexico

ATTACHED DOCUMENT

1. Progress of Activities fromMarch 2011 to March 2012

Cuban side presented the progress of the activities from March 2011to March 2012 as stated in Annex II.The achievement of the said period was summarized with the objectively verifiable indicators as shown in the table below. After 31 months have passed since the commencement of the Project, this extension of time meets to 51% of the entire Project term of 61 months, the whole groups have raised higher rate of achievement as the rate of elapsed time of the Project, 51 %.

Verification of Achievement by C/P Group of Output
(Covering term for valuation: Mar. 2011-Mar. 2012)

Output	Average value of indicator
1. Comprehensive management capacity on solid waste of DPSC is improved.	70 %
2. Solid waste source separation at Pilot Project Site is promoted and capacity of UPPH in organic waste reduction at the source is strengthened.	87 %
3. Capacity of UPPH in the collection and transportation of solid waste is strengthened.	56 %
4. Capacity of UPPH and DPSC on landfill design and operation of final disposal site is strengthened.	58 %

As long as the indicators exhibit, it seems that the project will be definitely achieved by attaining 100% of target within 30 months of the remaining half of the project period. However, the distinctive feature of the latter half of the project period is the smaller input of Japanese experts than the first half: Japanese experts will be assigned approximately 26 man/months in total during the latter half of the period whereas approximately 48 man/months were assigned during the first half. This reduction of input asks the Cuban side for more efforts by themselves than ever. In addition, in view of remaining project period by output, some sectors have shorter period than the standard of 30 months (remaining 27 months). This reminds the C/Ps of relevant groups to get ready for more intensive time schedule than others. The relevant groups are as follows:

Output 1: For other activities than CA and review of M/P, up to March 2013: 12 months out of latter half of the project period (remaining 9 months)

Output 2: Up to December 2013, just before the final evaluation: 21 months out of latter half of the project period (remaining 18 months)

2. Progress of Preparation Works Necessary for Installation of Equipment being Donated

Cuban side presented the progress of the preparation work for installation of equipment being donated at the following locations.

(1) Central Workshop
(2) Heavy Equipment Workshop
(3) Compost Yard

The progress of the preparation workswas explained by Cuban side as follows:

#	site	completed work	works to be done (schedule of completion)
(1)	Central Workshop		
	machining workshop	• Remodeling of house, power supply, lighting, ventilation, window • Installation of new equipment	• Installation of hack-saw machine (finished)
	injection test dep't.	• Remodeling of house, power supply, ceiling, ventilation, air conditioning • Installation of new equipment	• Installation of fuel injection pump tester (scheduled to install in this week)
	greasing shop	• Remodeling of house, power supply, roof, external tank • Installation of new equipment	
	repair shop #1 #2 & #3	• Remodeling of house, power supply, roof, utility room, cranes and air pipe network • Installation of new equipment	• Installation of hose crimping machine, hydraulic press, air tank, compressor (scheduled to install within next week)
	car washing yard & sanitary works	• Installation of car washers	
	tire workshop	• Remodeling of house, power supply, roof • Installation of new equipment	• Installation of tire changer and placing of wheel dolly (finished)
(2)	heavy equipment workshop		
	maintenance workshop	• Remodeling of house, power supply, roof • Installation of new equipment	• Installation of grinder and bench vise (scheduled to install in this week)
	tire workshop	• Remodeling of house, power supply • Installation of new equipment	• Installation of tire changer (finished)
(3)	Compost Yard		
	building	• Remodeling of house, power supply,ceiling, retention wall, drainage, lighting, water supply, gate	
	special function	• office, storage, raw material processing room, locker room	
	mechanical chopper	• electric motor	

3. Progress of Introduction of Those Equipment DonatedAdditionally

The Cuban side presented the contents of equipment brought to the Central Warehouse of UPPHas shown in Annex IIIand the progress of receiving after the inspection. The transportation of equipment took place as shown in the table below.

Contents	Entrance of Cuba	Place of delivery	Date of delivery
Equipment for the Workshop of Heavy Machinery	Havana Port	the Central Warehouse	June 7, 2012
Equipment for The Central Workshop	Havana Port	the Central Warehouse	June 5, 2012

Those equipment such as fuel injection pump tester which need installation work corresponds to no.1 to no.7 of the list in Annex III. The time of completion of installation works are all scheduled within this month, June 2012 at latest.

4. Custody and Sustainable Operation of Donated Equipment

The Cuban side presented the system of custody and sustainable use of donated equipment for longer life of equipment and larger effect of the use as shown in Annex IV.

The Japanese side gave the comments on the presentation as follows:

a. The traffic accident with the truck donated by JICA impeded the execution of the Project and injured the estate. With the occurrence of the accident, the Japanese side felt a deep regret and wanted to have the opinion of the responsible person on the case, and
b. The Japanese side requested the Cuban side to present the process of repair work and its progress monthly to the office of JICA in Mexico in writing, and
c. The Japanese side also requested the Cuban side to provide the preventive measures against the recurrence of the similar case that referred to the followings:
   ① To effect car insurance
   ② To exclude the use of the truck for other purposes than the original one
   ③ To keep the operation record of the truck and its disclosure to JICA

The Cuban side accepted the requests of the Japanese side and affirmed to take necessary actions.

5. Proposal for Modification of Project Design Matrix(PDM)

The PDM3 version was agreed by JICA and the Intermediate Evaluation Team on October 7, 2011. On January 26, 2012, JICA and the people concerned from the Cuban side decided to extend the Project term until September 30, 2014. Based on this decision, the Plan of Operations was modified. During the fourth meeting of the Joint Coordination Committee, both sides agreed to modify PDM3 into PDM4, which specifies that the Project term should be approximately 5 years long as shown in Annex I.

JET proposed a draft modification of Objectively Verifiable Indicatorsas stated in Annex V attached hereto. Both sides discussed the proposal and agreed to modify the Objectively Verifiable Indicators in PDM according to the proposal.

JET presented the PO that was modified by the Cuban side and JICA Mission in accordance with the extension of project period by one and a half years.

6. Proposal for Participation inTraining Courses in the Third Country

The Cuban side proposed a plan for dispatching some groups of Cuban Counterparts, DPSC/UPPH staff involved in the Project and the staff of cooperating entities involved in the activities related to the Output 4 of the Project for training in the third country as stated in AnnexVI.

The Japanese side explained that first of all needs the Cuban side to submit the request letter of this type of training to JICA. Upon receiving the letter JICA would take it into consideration and initiate necessary actions.

The Cuban side replied that Director of DPSC would submit the said letter to the JICA office in Mexico.

7. Personnel Change

The Cuban side explained the revised assignment of personnel for the project implementation as stated in Annex VII.The Cuban side appointed Mr. José Carlos Batista Roca, DPSC Director, as Project Director. Mrs. Odalys García Fonseca continues to be the Project Manager. The Japanese side explained no objection to the new assignment.

Participants

Cuban Side		
Mr. José Carlos Batista Roca	DPSC,Director	Project Director
Mr. Adalberto González Arce	UPPH, Director	
Mr. José Antonio Loyola	Vice-director of Investment – Development and Cooperation, DPSC	
Mrs. Odalys García	Senior Specialist, Vice-direction of Investment– Development and Cooperation, DPSC	Project Manager
Mr. Félix Arturo Abreu	UPPH, Vice-director General	
Mr. Alejandro Fernández	Vice-director of Sanitation, UPPH	
Mr. Alberto Figueras	Senior Specialist, Vice-direction of Investment – Development and Cooperation, DPSC	
Mr. Ernesto Domínguez	DPSC	
Mrs. Jaynet García Portero	DPSC	
Mr. César de Las Pozas	DPSC	
Mrs. Grettel Gutiérrez	DPSC	
Mr. Raúl Aguilar	Vice-director of Mechanization, UPPH	
Mrs. Nury Cárdenas	UPPH	
Mr. Alberto Cepero	UPPH	
Japanese Side		
Embassy		
Mr. Atsushi Tsukiyama	Secretary	
JICA		
Mr. Naoki Kamijo	Resident Representative of JICA in Mexico	
Mr. Eiji Araki	Program Officer, JICA Mexico	
Mr. Kenichiro Kawaji	Expert of JICA in Cuba	
JICA Expert Team		
Mr Kihachiro Urushibata	Chief Adviser	
Mr. Ryo Hiraga	Vehicle Maintenance	
Mr. Toshihiko Chiba	Landfill Design and Operation	

A.1.7.　議事録 (第5回合同調整委員会：2013年6月13日)

MINUTES
OF
THE FIFTH JOINT COORDINATING COMMITTEE
FOR
THE PROJECT FOR IMPROVEMENT OF CAPACITY ON
SOLID WASTE MANAGEMENT IN HAVANA CITY, THE REPUBLIC OF CUBA

The Fifth Joint Coordinating Committee of the Project for Improvement of Capacity on Solid Waste Management in Havana City, the Republic of Cuba (hereinafter referred to as "the Project") was held under the chairmanship of Mr. José Carlos Batista Roca, Director, Provincial Direction of Communal Services (hereinafter referred as "DPSC") and in the presence of the Cuban authorities concerned, representatives from Japan International Cooperation Agency (hereinafter referred as JICA), and JICA Expert Team.

Both the Cuban authorities concerned and the JICA Expert Team (hereinafter referred to as "JET") agreed to make this Minutes of Meeting, in order to confirm the mutual understandings reached through the discussion as attached hereto.

The Minutes of Meetings were written in Spanish and English languages, each text being equally authentic. In case of any divergence of interpretation, the English text shall prevail.

Havana City, 13 June 2013

Mr. Tadaya Yamamoto
Chief Adviser,
JICA Expert Team (JET)

Mr. José Carlos Batista Roca, Project Director
Director,
Provincial Direction of Communal Services in
Havana City (DPSC Havana)
Republic of Cuba

Mr. Ken Okumura
Representative of JICA,
Environmental Management Group,
Environmental Management
Division 2,
JICA Headquarters

ATTACHED DOCUMENT

1. Progress of Activities until May 2013

Cuban side presented the progress of the activities until May 2013 as stated in Annex I. The achievement of the said period was summarized with the objectively verifiable indicators as shown in the table below. After 45 months has passed since the commencement of the Project, this time period meets to 74% of the entire Project term of 61 months. Groups of Output -1, -2, and -3 have raised higher rate of achievement than the rate of elapsed time of the Project, 74 %. However the group of Output-4 has not raised the achievement rate for about recent one or two years.

Intermediate Verification of Achievement by C/P Group of Output
(Covering term for valuation: until May 2013)

Output	Average value of indicator
1. Comprehensive management capacity on solid waste of DPSC is improved.	92 %
2. Solid waste source separation at Pilot Project Site is promoted and capacity of UPPH in organic waste reduction at the source is strengthened.	79 %
3. Capacity of UPPH in the collection and transportation of solid waste is strengthened.	94 %
4. Capacity of UPPH and DPSC on landfill design and operation of final disposal site is strengthened.	58 %

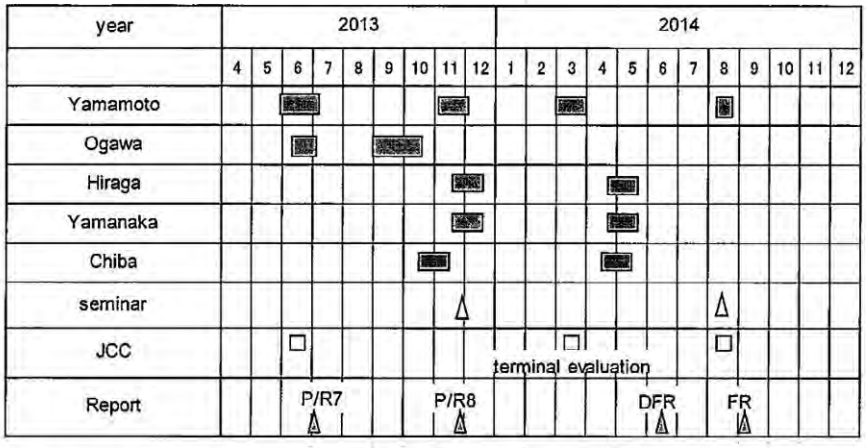
Japanese side stated that it is very worried about the delay in Output-4 activities and that the crucial factor for raising the achievement of Output-4 activities is the Cuban commitment for the New Guanabacoa landfill construction on time.

Cuban side stated that they will make their best efforts to expedite their resource commitment for the construction.

2. Activities for the remaining period of the Project

The Japanese side explained the schedule of activities for the remaining period of the Project as listed below, as well as the JET members' assignment schedule as shown in the timetable below.

- Annual seminars: at around November 2013, and August 2014.
- JCC: next JCC at around March 2014 for the terminal evaluation mission, and the final JCC at around August 2014.
- Publication of Progress Report 7 at around July 2013, Progress Report 8 at around December 2013, the Project Report (Draft Final) at around June 2014, and Submission of the Project Report (Final) at September 2014.



Cuban side confirmed the schedule.

3. Separate discharge and Separate collection of organic waste is prerequisite for Output-2 Advancement

The Japanese side explained the current impediment in Output-2 activities as follows.

The achievement rate of Output-2 is 79% on average, but the achievement rate concerning organic waste collection is 64%, and consequently, the achievement rate in producing compost is 53%. These rates are lower compared to other indicators in Output-2 group, and are lower compared to the rate of elapsed time of the Project. The main reason why the amount of organic waste collection is low is that containers for organic waste and large containers for non-organic waste are not located at the agricultural markets these days. Therefore, a compactor truck cannot collect organic waste because the containers exclusively for organic waste discharge are not located at the markets.

Japanese side stated that it will be very difficult to achieve satisfactory results at the end of the Project if the current situation continues, and it is essential prerequisite, for the compost pilot project, to provide containers for organic waste discharge, large containers for non-organic waste discharge, and a compactor truck exclusively for organic waste collection.

Cuban side stated that they will make their best efforts.

4. Equipment and Facilities Donated

Both sides confirmed that all equipment and facilities donated have been installed in the Central workshop, the Heavy Machine workshop and the Compost process yard by May 2013.

The Japanese side requested that Cuban side should take necessary measures for not only the appropriate maintenance of equipment and facilities installed but also necessary custody of donated tools and timely and adequate acquisition of spare parts and materials for equipment and facilities utilization.

The Cuban side confirmed the Japanese request.

A truck for organic waste collection, which is one of JICA's donating equipment and had been damaged by a traffic accident on 28 April 2012, was repaired by Cuban side. The repaired truck is in the process of obtaining a traffic circulation document.

The Japanese side requested that the Cuban side should obtain a traffic circulation document promptly and that the Cuban side should assign the truck for the pilot project of compost production with necessary custody for a long-life sustainable use of the truck.

The Cuban side stated that the truck will be assigned for the pilot project in not more than 30 days.

5. Training Courses in Mexico

In response to the Cuban request of training in the third country, the Project held two (2) courses in Mexico in December 2012. The Project is preparing to arrange one (1) course for superior managers from five (5) institutions concerned for the Project in Mexico in July 2013.

The Cuban side expressed its gratitude for the two (2) courses in December 2012 being very useful for understanding practical Solid Waste Management (SWM) activities, and requested to the Japanese side that the course initially planned in July 2013 should be postponed until November or December 2013, since superior managers from five (5) institutions concerned will be very busy for current duties around July 2013.

The Japanese side accepted the Cuban request of the training course postponement to around November – December 2013.

6. Counterpart Personnel Changes

The Cuban side explained the revised assignment of personnel for the project implementation as stated in Annex II.

The Japanese side stated that, because the principal objective of the Project is to formulate Cuban human resources in SWM, it is very worried that a number of counterpart personnel, to whom capacity development activities were being deployed in this Project, resigned from their jobs.

The Cuban side stated that they understand the Japanese anxiety and will make their best efforts to avoid further resignation.

The Japanese side stated no objection to the new assignment but requested Cuban side to take necessary measures for securing the continuity and sustainability of the Project outputs and activities.

The Cuban side confirmed the Japanese requests.

Annex I　Values Achieved in the Fourth Year of the Project

Summary of Achievement Rate by C/P Group

group	indicator	(%)	ave.	(#)
output 1	OG1	88		1
	OG4	100		2
	PP1	100		3
	PP4	100		4
	1-1	55		5
	1-2	100		6
	1-3	100		7
	1-4.1	77		8
	1-4.2	100		9
	1-5.1	100		10
	3-2 VF	79		11
	3-2 NC	100		12
		1099	92 %	
output 2	OG2	100		1
	PP2	64		2
	1-5.2	70		3
	2-1	64		4
	2-2	53		5
	2-3	100		6
	2-4	100		7
		551	79 %	
output 3	PP3	93		1
	3-1	100		2
	3-3.1	91		3
	3-3.2	91		4
		375	94 %	
output 4	OG3	50		1
	PP5	50		2
	4-1	50		3
	4-2	80		4
		230	58 %	

1

no.	PDM3 Indicators	Value	Remarks
Overall Goal	**Urban solid waste management is properly implemented in Havana City and sanitary environment of the City is improved.**		
OG1	Volume of primary materials recovered from waste in Havana City reach 6,400 t/y from the current level of 4,000 t/y.	88%	The actual volume of raw materials recovered in the year 2012 amounted to 6,100 tons. As the volume increase required to achieve the goal is 2,400 tons/year and the volume increased by 2,100 tons in 2012 (compared to 4,000 tons/year), the achievement rate amounts to 88%. Achievement rate : 2,100/2,400 = 88 %
OG2	Over 2 entities in Havana City consider to introduce waste reduction model practiced in Pilot Project while there was no entity at the beginning of the Project.	100%	It is not known whether all of them will introduce it after the end of the Project. (At present, 3 entities: 150%)
OG3	Number of environmentally-friendly final disposal landfill which is properly maintained is more than 2 at the end of the Project while there was only 1 at the beginning of the Project.	50 %	Calle 100 is the only final disposal site currently being operated. Some of its facilities still have a certain level, while others have slightly improved. The works to shut down 8 Vías landfill site already began as it may pose a serious threat to the basin. In Tarará, heavy equipment is being operated to put out fires. They have moved from plain waste dumping to waste compaction by using heavy equipment and reducing the slope.
OG4	The level of satisfaction among Havana's citizens in terms of the integrated solid waste management increases. As a representative indicator, the reduction in the number of complaints is used. The number of complaints decreased from 60/year/municipality to 36/year/municipality.	100%	The time lapse to be revised corresponds to process I and process II of the 14th term of office (from June, 2012, to March, 2013). The table below shows the number of complaints filed over a period of 11 months in those municipalities where the complaints were recorded. The record shows that the number of complaints did not exceed the target 36 in any municipality. Consequently, it can be inferred that the target number

			was achieved in all the 15 municipalities. The achievement rate is 100 % (15 out of 15).
Project Purpose	**Capacity of DPSC on urban solid waste management in Havana City is strengthened through collaboration among cooperative organizations.**		
PP1	5 improved activities on urban solid waste management are undertaken and being established during final 12 months of the Project. Namely; (i) The training program is formulated and begins to be implemented for DPSC/UPPH's members based on the experience with the trained Core Group regarding Output-1;	100%	Up to March, 2013, 6 seminars for DPSC managers, 11 training courses for communal area managers, and 11 courses for sanitation technicians were held. A seminar for landfill site operators and 2 training courses in Mexico on landfill site management were also held. The average achievement is 100%.
n	ii) Organic waste reduction achieved in the pilot project (to be about 1.5 ton/day) to be maintained regarding Output-2;	64%	It is very unstable as organic waste reduction is not carried out on a daily basis. (Average daily weight: 962kg)
	iii) Vehicle repair and maintenance system upgraded (about 10% reduction of time required for several representative repair/maintenance works in the Workshop) by trained mechanics using equipment donated by the project to be maintained and	93%	It is targeted, comparing before and after of donation facilities usage, to reduce 10% time in above 6 maintenance areas. In May 2013, all remaining works for facilities were completed and therefore all donation facilities are available for utilization. Time reduction of more than 10% have already recorded in four (4) maintenance area, while measurement of time reduction has not conducted in other two (2) areas. In this context, the target achievement is calculated as 93% based on the assumption that 4 areas gained 100% achievement and other 2 areas gained 80% achievement due to lack of measurement records. (4 x 1.00 + 2 x 0.8) / 6 x 100 = 93%.
	iv) Improvement of collection and transportation by means of the upgraded CDT and frequency optimization (productivity per liter of oil is expected to reach 0.90m3/L as	100%	All collection vehicles run on diesel oil. Loaders and dump trucks used for bulky waste collection also run on diesel oil. For bulky waste collection, fuel efficiency improved slightly,

<table>
<tr><td></td><td>compared to the 2008-09 level of 0.80m3/L) to be maintained regarding Output-3; and</td><td></td><td>that is, from 0.80 m^3/L in 2008-09 to 0.90 m^3/L in 2013)</td></tr>
<tr><td></td><td>(v) Environmentally friendly landfill design advised by JET is incorporated into the new East Landfill to be constructed regarding Output-4.</td><td>50%</td><td>Based on MEP's decision to revise the East Sanitary Landfill Site project in order to reduce costs, some changes were introduced into the design of some of its facilities. Construction is scheduled to begin in the second half of 2013.</td></tr>
<tr><td>Output 1</td><td colspan="3">Comprehensive management capacity on solid waste of DPSC is improved.</td></tr>
<tr><td>1-1</td><td>Master Plan is updated by the end of the Project with 2 component projects, namely "construction of the new landfill in east and innovation of the workshops for vehicles & heavy machineries" physically completed at the rate of completion 100% and 100% respectively.</td><td>55%</td><td>
<table>
<tr><th>Place</th><th>Goal</th><th>Actual</th><th>Achievement Rate</th></tr>
<tr><td>New East landfill site</td><td>Begins to operate the new landfill site</td><td>Civil work design completed</td><td>10 %</td></tr>
<tr><td>Improvement of the maintenance workshops</td><td>Begins to operate all donated tools and equipment</td><td>All donated tools and equipment are currently being operated</td><td>100 %</td></tr>
<tr><td></td><td></td><td>Average %</td><td>55 %</td></tr>
</table>
</td></tr>
<tr><td>1-2</td><td>Management process is improved in 3 aspects.</td><td>100%</td><td>The following are two of the ways introduced to check the completion of the preparation works required to install donated equipment:
A working team was established to include acquisition, construction, and design sections from DPSC and UPPH in order to speed up the Project implementation. The team met on a weekly basis.
DPSC's management was directly involved to make the most of their negotiation skills in order to facilitate materials acquisition for the Project works.
In order to meet deadlines and to ensure the quality of hired services, the following third improvement was introduced in 2013:</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>• Include clauses in the contract signed with the contractor to prevent delays (in case of any delay, the contractor should be held responsible for it and act accordingly) and to ensure the quality of construction works.

As the goal is to introduce three improvements, the achievement rate amounts to 100% (3/3).</td></tr>
<tr><td>1-3</td><td>Quality of DPSC management-related report on plan, monitoring and evaluation is improved by establishing 2 kinds of management reports.</td><td>100%</td><td>Progress Report (2) included the format for the report on the plan and progress monitoring as a model report for project management. Progress Report 6 included the format for the project evaluation report. Consequently, the achievement rate is 100% (3/3).</td></tr>
<tr><td>1-4.1</td><td>Core Group: a total 136 people are trained.
1) 15 Directors in technical and economic management for supervision, integrated management and work safety.
2) 106 Heads of Communal Zones in integrated management (waste collection-transportation-final disposal) and work safety.
3) 400 Technicians in integrated management (waste collection-transportation-final disposal) and work safety.</td><td>77%</td><td><table>
<tr><th>Group to be Trained</th><th>Goal (people)</th><th>Actual(people)</th><th>Achievement %</th></tr>
<tr><td>DPSC's managers</td><td>15</td><td>33</td><td>100 %</td></tr>
<tr><td>Communal Zones managers</td><td>106</td><td>85</td><td>80%</td></tr>
<tr><td>Technicians</td><td>400</td><td>205</td><td>51%</td></tr>
<tr><td></td><td></td><td>Average</td><td>77 %</td></tr>
</table></td></tr>
<tr><td>1-4.2</td><td>Manuals (Textbooks) are prepared (3 kinds)</td><td>100%</td><td>Three manuals have been prepared up to January, 2013.</td></tr>
<tr><td>1-5.1</td><td>Solid waste education is conducted for 6 elementary schools and 2 junior high schools of the Popular Council of Miramar through the "Red de Formación Ambiental" while there was no such activity at the beginning of the Project.</td><td>100%</td><td>Some relevant activities are currently being carried out in 6 primary schools and in 2 secondary schools. The achievement rate is 100 % (8/8).</td></tr>
<tr><td>1-5.2</td><td>Solid waste education for the employees of entities within the Popular Council of Miramar is conducted at 10 entities while</td><td>70%</td><td>Seven (7) entities have attended the seminars held.</td></tr>
</table>

	there was no such activity at the beginning of the Project.		
Output 2	**Solid waste source separation at Pilot Project Site is promoted and capacity of UPPH in organic waste reduction at the source is strengthened.**		
2-1	Organic waste for composting in Pilot Project Site is collected by1,500 kg per day.	64%	It is extremely unstable as organic waste collection is not carried out on a daily basis. (Average daily weight:962kg)
2-2	Compost in Pilot Project Site is produced to 650 kg per day.	53%	348kg is the wet weight. (Average daily weight: 348/650kg = 53%)
2-3	Percentage of foreign material in organic waste to compost plant is reduced by 50 % as compared to the percentage at the beginning of the project.	100%	The wastes collected using containers hardly include foreign materials.
2-4	Behaviour change of local institutions in Pilot Project Area on waste reduction and separated collection reaches 5 institutions while there was no such institution at the beginning of the project.	100%	After the truck accident, one institution stopped cooperating. (5 institutions)
Output 3	**Capacity of UPPH in the collection and transportation of solid waste is strengthened.**		
3-1	Average downtime of working collection vehicles is recovered to the level of CDT (Coeficiente de Disponibilidad Técnica) at 63.2 %, and recovered the level of TR (Time for Repair) at 8.38 hrs/month and the level of TE (Time for Waiting to be repaired) at 5.46 hrs/month. * External factors: Spare parts and materials necessary for repair and maintenance of collection vehicles are supplied.	100%	In comparing before and after of donation facilities utilization, as the improvement of all CDT, TR, and TE is evident as shown in the table below, it is assumed 100% achievement. Details in CDT, TR, and TE improvement will be shown in the Progress Report 8.
3-2	Frequency of waste collection and transportation by UPPH is optimized with the index of VF (rate of Functioning Vehicle to Number of collection route) at 90% and NC (rate of Necessity of Container to planned number of container) at 15%. * External factors: It is possible to obtain reliable weighbridge data.	VF: 79%	With regard to VF : Operating Vehicles (ratio of operating vehicles to number of collection routes), the goal is to reach 90%. However, as shown in the table below, an achievement rate of 79% is assumed. 71%/90% x 100 = 79%

<table>
<tr><td></td><td></td><td>NC: 100%</td><td>
<table>
<tr><th>Año</th><th>R=No.de rutas</th><th>T=Vehículosfuncionar.do</th><th>VF = T/R</th></tr>
<tr><td>2013</td><td>72</td><td>51</td><td>71 %</td></tr>
</table>
<90%

With regard to NC: Rate of containers required (Ratio of the number of containers required to the number of containers planned), while the goal is to reach 15%, the actual rate is 10%, the achievement rate of 100% is assumed.
<table>
<tr><th>Year</th><th>P=Planned</th><th>Actual</th><th>N=Required (P-Actual)</th><th>Required N/P (%)</th></tr>
<tr><td>2013</td><td>21820</td><td>19620</td><td>2200</td><td>10</td></tr>
</table>
</td></tr>
<tr><td>3-3.1</td><td>At the 7 main areas of the maintenance workshop (chassis, welding, machine tool room, tire repair shop, electricity, hydraulics, and injection lab), 20 mechanics are trained to correctly operate the equipment donated by the Project.</td><td>91%</td><td>It generally has 100% achievement. It is planned to measure the achievement rate in conducting examinations for mechanics. Examination results will be utilized for achievement rate confirmation, although it is certain that vehicle maintenance capacity of mechanics is being developed.
It is assumed that 91% achievement is gained because the below manuals elaboration and mechanics training are developed in parallel with each other.</td></tr>
<tr><td>3-3.2</td><td>Seven (7) maintenance manuals are prepared for the main areas mentioned in 3-3.1.</td><td>91%</td><td>Up to May 2013, twenty (20) out of twenty two (22) manuals were made.
20/22×100=91%.</td></tr>
<tr><td>Output 4</td><td colspan="3">Capacity of UPPH and DPSC on landfill design and operation of final disposal site is strengthened.</td></tr>
<tr><td>4-1</td><td>The existing final disposal sites are properly operated and managed in dumping, surface compaction, soil cover, slope protection and leachate treatment at 3 sites while only 1 site at the beginning of the Project.</td><td>50%</td><td>The wastes dumped at the landfill sites are being compacted and covered with soil. However, no leachate treatment is available. A project for leachate recirculation at</td></tr>
</table>

			Calle 100 site is currently being prepared. Construction is scheduled for the year 2014. Moreover, the new landfill site to be built will include a treatment plant.
4-2	The design of New Final Disposal Landfill in East is revised in an environmentally-friendly way for 11 improvements while 0 at the beginning of the Project.	80%	An improvement was introduced for the site to be more environmentally-friendly, that is, a leachate treatment plant (an anaerobic lagoon, an aerated lagoon, and a wetland) will be built instead of an oxidation pond.

Annex II　Project Staff Changes

Project Director: Mr. José Carlos Batista Roca, Director, DPSC

Project Manager: Ms. Odalys García Fonseca, Principal Specialist, Development and Collaboration, Vice Direction of Investment –Development and Collaboration, DPSC

Counterparts:

Name	Position
Group 1. Solid Waste Management:	
(1) Mr. Alfredo Rodriguez	Tecnico de Hygiene, UPPH
(2) Sra. Jaynet García	Solid Waste Specialist, DPSC
(3) Ms. Mariana Hechavarría	Collaborator for Public Relations*, Head of Dissemination, DPSC
(4) Mr. Juan Herrera	Environmental Specialist, CITMA-Havana
(5) Ms. Élida Romero	Environmental Impact Assessment and Management Specialist, CITMA-Havana
(6) Alien Suarez	Solid Waste Specialist, DPSC
Group 2. Waste Reduction and Composting	
(1) Mr. César De Las Pozas	Mechanical Engineer, DPSC
(2) Mr. Apolonio Serrano	Chief of Bio-gas and Compost, UPPH
(3) Mr. David Santana	Technician, Bio-gas and Compost Unit, UPPH
Group 3. Vehicle Maintenance and Workshop Management	
(1) Mr. Fernando Amyl	Vice-Director of Mechanization, UPPH
(2) Mr. Felix Arturo Abreu	Administrator of Workshop for Collection Vehicle, UPPH
(3) Mr. Jorge Quintana	Administrator of Workshop for Heavy Machinery, UPPH
(4) Mr. Fernando Gonzales	Vice-Director of supply, UPPH
(5) Mr. César De Las Pozas	Mechanical Engineer, DPSC(assistance in monitoring of preparation for the installation of Equipment)
(6) Mr. Enrique García	Specialist of Repair and Maintenance, UPPH
(7) Mr. Eduardo Jimenez	Specialist of Repair and Maintenance, UPPH
(8) Ms. Nury Cárdenas	Specialist of Repair and Maintenance, UPPH
Group 4. Landfill Design and Final Disposal Site Operation	
(1) Mr. Ernesto Domínguez	Solid Waste Specialist, DPSC
(2) Mr. Hermes del Toro	Civil Engineer, Management, DPSC
(3) Mr. Alexis Vazquez	Chief of Landfill Unit, UPPH
(4) Mr. Lázaro Sotolongo	Supposed Chief of New Guanabacoa Landfill
(5) Ms. Harilin Tamayo	Engineer Hydraulic
Group 5. General Affairs	
(1) Mr. Osvaldo Navarro	Director UPPH

A.1.8. 議事録 (終了時評価：2014年3月20日)

Minutes of Meeting
between
The Cuban Terminal Evaluation Team
and
The Japanese Terminal Evaluation Team
on
Project for Improvement of Capacity on Solid Waste Management in Havana city, Republic of Cuba

The Japanese Terminal Evaluation Team (hereinafter referred to as 'the Japanese Team'), organized by Japan International Cooperation Agency (hereinafter referred to as 'JICA') and headed by Dr. Mitsuo Yoshida, visited Republic of Cuba from March 2 to 20, for the purpose of conducting the joint terminal evaluation on the Technical Cooperation Project for Improvement of Capacity on Solid Waste Management in Havana city, Republic of Cuba (hereinafter referred to as 'the Project') on the basis of the Record of Discussions signed on May 18, 2009.

During the visit, the Japanese Team had a series of discussions, site visits, and exchanged views with the Cuban Terminal Evaluation Team (hereinafter referred to as 'the Cuban Team') consisting of representatives from the Ministry of Trade and Investment, Ministry of Science, Technology and Environment, Provincial Direction of Communal Service (hereinafter referred to as 'DPSC'), and Provincial Assembly of People's Power. The both teams worked as the Joint Terminal Evaluation Team, and discussed on the Joint Terminal Evaluation Report attached as Appendix.

As a result, the Cuban Team and the Japanese Team mutually agreed upon the attached document. The Minutes of Meeting and its Appendixes are prepared in English and Spanish. In case of any divergence of interpretation, the English version shall prevail.

Havana, 20 March, 2014

Dr. Mitsuo Yoshida
Leader,
Japanese Terminal Evaluation Team,
Senior Advisor,
Japan International Cooperation Agency (JICA)

Mr. Mario Herrera Justiz
Director,
Provincial Direction of Communal Service (DPSC),
Cuba

Attachment document

(1) The Joint Terminal Evaluation Team confirmed contents of the Joint Terminal Evaluation Report attached as Appendix I and formally accepted the report.

(2) Both sides confirmed that the Project has successfully carried out activities. Through these activities, the Project achieved good results at the time of six months before the project completion on all outputs specified in PDM, namely; "Output 1: Comprehensive management capacity on solid waste of DPSC is improved", "Output 2: Solid waste source separation at Pilot Project Site is promoted and capacity of UPPH in organic waste reduction at the source is strengthened" and "Output 3: Capacity of UPPH in the collection and transportation of solid waste is strengthened". "Output 4:Capacity of UPPH and DPSC on landfill design and operation of final disposal sites is strengthened." Both sides also confirmed that "Project Purpose: Capacity of DPSC on urban solid waste management in Havana City is strengthened through collaboration among cooperative organizations" will be accomplished if the Project activities are implemented until the project completion based on the plan of operation.

(3) Both sides express their respect for the Project member of DPSC headed by Ms. Odalis Garcia and JICA experts headed by Mr. Tadaya Yamamoto who guided to the successful implementation of the Project.

(4) In the occasion of the terminal evaluation, DPSC, CITMA, MINCEX, and Havana Provincial Assembly showed sincere appreciation to the continuous support provided by JICA in the field of solid waste management.

(5) Cuban side expressed their strong intention to make best efforts for sustainability of the achievements of the Project. According to their explanation, in spite of their best efforts, there are unavoidable difficulties to ensure the sustainability under current situations. In this regards, Cuban side requested Japanese side to continue technical support in the solid waste management sector. In response to the request, the Japanese team promised to convey the Cuban side's request to the JICA headquarters.

Appendix I　Joint Terminal Evaluation Report
Appendix 2　Participant List

Joint Terminal Evaluation Report
on
Project for Improvement of Capacity on Solid Waste Management in Havana city
in the Republic of Cuba

Havana, 20th March 2014

Cuban-Japanese Joint Terminal Evaluation Team

Acknowledgements

The text of the Joint Terminal Evaluation Report in English and Spanish has been prepared under the responsibility of Joint Terminal Evaluation Team with collaboration of English-Spanish translators; Mr. Vicente García and Ms. Roxana Fernandez. The final version was confirmed at Joint Evaluation Meeting on 19th March, 2014. The team is indebted to Mr. Tadaya Yamamoto, Chief Advisor of the Project and his team for their continuous support for conducting the Terminal Evaluation.

Joint Terminal Evaluation Team

Cuban Team

Mr. Mario Herrera Justiz, Director, Provincial Direction of Communal Service (DPSC),

Ms. Odalys García Fonseca, Principal Specialist,Provincial Direction of Communal Service (DPSC)

Mr Osmani Castro Cruz, Specialist, Cooperation, Provincial Direction of International Relation and Collaboration, Havana

Mr. Pedro M. de la Torre Rodríguez, Specialist, Cooperation, Provincial Direction of International Relation and Collaboration, Havana

Mr. Juan Herrera , Specialist, CITMA Havana

Ms. Ivón Martínez, Specialist, Direction of Asia and Oceania, MINCEX

Japanese Team

Dr. Mitsuo Yoshida, Senior Advisor, Japan International Cooperation Agency (JICA)

Mr. Ken Okumura, Deputy Assistant Director, Japan International Cooperation Agency (JICA)

Mr. Satoshi Nagashima, Senior Consultant, ICONS, Inc.

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Annex 6: List of equipment procured by Japanese side
Annex 7: Trainings in third country
Annex 8: List of seminars and workshops organized by the Project
Annex 9: Result of capacity assessment for each Output group
Annex 10: Final Evaluation of the Sustainability of the Activities Related to the Project

Abbreviations

CITMA	Ministry of Science, Technology and Environment, Government of the Republic of Cuba
C/P	Cuban Counterpart to Japanese Expert Team
DPSC	Provincial Direction of Communal Services, Havana
JCC	Joint Coordination Committee
JET	Japanese Expert Team
JFY	Japanese Fiscal Year
JICA	Japan International Cooperation Agency
MINCEX	Ministry of Trade and Investment
M/M	Minuets of Meeting
M/P	Master Plan
PDM	Project Design Matrix
PO	Plan of Operation
UPPH	Provincial Unit of Hygiene, Havana

1. Outline of the Evaluation

1-1 Objectives of the Evaluation

The evaluation activities were performed as follows:

(1) To collect necessary information and confirm the progress of inputs, activities and implementation process on the basis of Project Design Matrix (PDM) and Plan of Operation (PO) of the Project for Improvement of Capacity on Solid Waste Management in Havana city (hereinafter referred to as "the Project")

(2) To assess the achievement of Outputs, Project Purpose and Overall Goal

(3) To analyze and evaluate the overall effect of the Project by the five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact and Sustainability)

1-2 Schedule of the Evaluation

The schedule of the mission is indicated as below:

Date	Day	Schedule
3rd Mar	Mon	Meeting with JICA coordination expert Visit of compost yard Interview with C/Ps of Output 2
4th Mar	Tue	Interview with C/Ps of Output 1 Visit at school on environmental education
5th Mar	Wed	Visit of vehicle maintenance facility Interview with C/Ps of Output 3
6th Mar	Thu	Interview with C/Ps of Output 4 Interview with designers of final disposal site
7th Mar	Fri	Interview with C/Ps of Output 4 Visit agricultural market
8th Mar	Sat	Drafting the evaluation report
9th Mar	Sun	Drafting the evaluation report
10th Mar	Mon	Interview with Direction of Economic and Planning
11th Mar	Tue	Interview with project manager Drafting the evaluation report
12th Mar	Wed	Presentation on evaluation method to evaluation team of Cuban side Drafting the evaluation report
13th Mar	Thu	Drafting the evaluation report
14th Mar	Fri	Site Survey, Drafting the evaluation report

15th Mar	Sat	Drafting the evaluation report
16th Mar	Sun	Drafting the evaluation report
17th Mar	Mon	Site Survey Courtesy visit (Project Director, Habana Province Deputy Mayor) Courtesy visit to CITMA Habana
18th Mar	Tue	Presentation of summary of Activities and Achievements by Project Groups Courtesy visit to MINCEX Translation of Draft Evaluation Report, Minutes of Meeting (M/M)
19th Mar	Wed	Discussion on Draft Evaluation Report, M/M Translation of Evaluation Report, M/M
20th Mar	Thu	JCC, signing M/M, Reporting Embassy of Japan

1-3 Members of the Evaluation

The joint terminal evaluation team (hereinafter referred to as "the Team") consists of the following members;

(1) Cuban members

Name	Title	Position in the Team
Mr. Mario Herrera Justiz	Director, DPSC	Team Leader
Ms. Odalys García Fonseca	Principal Specialist, DPSC	Member
Mr. Osmani Castro Cruz,	Specialist, Cooperation, Provincial Direction of International Relation and Collaboration	Member
Mr. Pedro M. de la Torre Rodríguez	Specialist, Cooperation, Provincial Direction of International Relation and Collaboration	Member
Mr. Juan Herrera	Specialist,CITMA Habana	Member
Ms. Ivón Martínez	Specialist, Direction of Asia and Oceania,Ministry of Foreign Trade and Investment	Member

(2) JICA mission members

Name	Title	Position in the Team
Dr. Mitsuo YOSHIDA	Senior Advisor, JICA	Team Leader
Mr. Ken OKUMURA	Deputy Assistant Director,	Coordination Planning

	Global Environment Department, JICA	
Mr. Satoshi NAGASHIMA	Senior Consultant, ICONS Inc.	Evaluation Analysis

1-4 Method of the Evaluation

The Project was jointly evaluated by the Team. The Team visited the project sites and carried out a series of interviews and discussions with DPSC/UPPH C/Ps, designers in state designing company, teachers in schools, etc. The evaluation was designed to verify the following aspects based on the PDM and PO:

1) Achievements of the Project on the basis of indicators of PDM version 4 (Annex 1) and Evaluation Grid (Annex 3);
2) Process of the Project implementation; and
3) The five evaluation criteria.

Definitions of the five criteria are as follows:

Relevance	Relevance of the plan for the Project has been reviewed in terms of validity of the Project objective and overall goal, in connection with the development policy of the Government of Cuba, the foreign assistance policy of the Government of Japan, the needs of beneficiaries, and the logical coherence of the Project.
Effectiveness	Effectiveness is considered by assessing the extent of achievement of the Project objective and the clarification of the relationship between the Project purpose and the outputs.
Efficiency	Efficiency of the implementation of the Project is analyzed with focus on the relationship between outputs and inputs in terms of time, quality and quantity of inputs.
Impact	Impact of the Project is evaluated on the basis of direct or indirect, positive or negative, intended or unintended influences generated by the Project, including the extent to which the Overall Goal has been attained.
Sustainability	Sustainability of the Project is evaluated on the political, institutional, financial and technical aspects for examining how the achievements of the Project would be sustainable by Cuban side after the period of the Project.

2. Outline of the Project

2-1 Background of the Project

After collapse of the Soviet Union in beginning of 1990's, economy of the Republic of Cuba (hereinafter referred to as Cuba) fell and it affected proper implementation of solid waste management. In Havana, it was difficult to transport the solid waste to the suburbs due to the lack of fuel and the solid waste was dumped in emergency disposal sites which were temporarily installed in several areas in Havana city. It caused some problems such as deteriorated living environment of the population. In addition, landfill capacity of major disposal sites was about to reach the limit, and also construction of new landfill site was an urgent issue.

Based on the background above, Government of Japan implemented a JICA Development Study entitled "The study on integrated management plan of municipal solid waste in Havana city (2003-2006)" based on the request from Government of Cuba, and the "Master Plan for Integrated Management Plan of Municipal Solid Waste in Havana City" (M/P) was developed for drastic improvement of solid waste management works in Havana. Based on the M/P, Government of Cuba and Havana city authority realized some matters such as closure of most of the emergency disposal sites, improvement of existing disposal sites self-procurement of waste collection vehicles and containers and decision of constructing new Guanabacoa final disposal site etc.

On the other hand, the budget for administration of solid waste was not sufficient due to lack of resource caused by economic blockade, nor was systematic human capacity development. Due to lack of capacity not only on technical aspect but also on institutional aspect and social system aspect, proper implementation of M/P was disturbed.

Based on the situation above, Government of Cuba requested to Government of Japan a technical cooperation project entitled "the Project for Improvement of Capacity on Solid Waste management in Havana city" for the purpose of reinforcement of integrated solid waste management, production of compost, reinforcement of vehicle maintenance workshop, improvement of existing final disposal site and assistance for construction of new sanitary landfill. The technical cooperation was officially agreed on between two governments, and the Project was commenced from September 2009 as a JICA technical cooperation project.

2-2 Summary of the Project

The Project design is drawn in the PDM (attached as Annex 1). The Project framework is as follows:

(1) Overall Goal

Urban solid waste management is properly implemented in Havana City and sanitary environment of the City is improved.

(2) Project Purpose

Capacity of DPSC on urban solid waste management in Havana City is strengthened through collaboration among cooperative organizations.

(3) Outputs

1) Comprehensive management capacity on solid waste of DPSC is improved.
2) Solid waste source separation at Pilot Project Site is promoted and capacity of UPPH in organic waste reduction at the source is strengthened.
3) Capacity of UPPH in the collection and transportation of solid waste is strengthened.
4) Capacity of UPPH and DPSC on landfill design and operation of final disposal sites is strengthened.

2-3 Duration of the Project

Five years and one month from September 2009 to September 2014

2-4 Implementing Agency of the Project

DPSC/UPPH

2-5 Target Areas of the Project

Havana

2-6 Target Groups of the Project

Staff of DPSC/UPPH, designers of state designing companies

3. Achievements and Implementation Processes

3-1 Achievements of the Project

3-1-1 Inputs

(1) Input from Cuban side

1) Assignment of C/Ps

Cuban has assigned C/Ps for the Project. The detail is shown in "Annex 4-1: List of Cuban C/Ps" and "Annex 4-2: Cuban C/P assignment history)

2) Facilities and utilities

A project office, a vehicle maintenance workshop, a compost yard were provided by Cuban side.

3) Operational cost

Expenses for maintenance and repair of the vehicle maintenance workshop and the compost yard were provided by Cuban side (200,000 CUC and 460,000CUP). In addition, expense for utility, telephone and transport was incurred by Cuban side.

(2) Input from Japanese side

1) Japanese experts

Eight Japanese experts have been dispatched by JICA in the course of the Project implementation. The detail is shown in "Annex 5: List of Japanese experts".

2) Machinery and Equipment

Machinery and Equipment have been procured as "Annex 6: List of equipment procured by Japanese side".

3) Trainings in third country

Trainings in third country have been organized as "Annex 7: Trainings in third country".

4) Operational cost

Part of the operational cost has been also borne by Japanese side as follows.

Table 1: Operational cost borne by Japanese side

	JFY 2009	JFY 2010	JFY 2011	JFY 2012
General operating expenses	11,027.58	24,525.30	10,756.57	12,078.29
Travel expense (Air fare)	59,479.87	146,222.54	178,740.73	97,822.85
Travel expense (Others)	57,498.04	207,289.20	175,235.03	169,480.49
Fee and honorarium	6,913.58	99,678.18	95,549.01	74,193.21
Meeting expenses	20,562.08	14,216.68	8,760.88	1,689.66
Annual Total (USD)	155,481.15	491,931.90	469,042.23	355,264.51
	1,471,719.8			

Source: Project team

3-1-2 Achievements of the Outputs

Output 1: Comprehensive management capacity on solid waste of DPSC is improved.

Summary: Output 1 is likely to be achieved mostly within the project period. Comprehensive management capacity on solid waste of DPSC was improved, through the activities of Output 1. The M/P prepared by the JICA Development Study (2003-2006) was updated, management process was improved, trainings were carried out for core group of DPSC, various manuals were prepared, and process of solid waste education was enhanced. However, one of priority projects planned in M/P, "construction of the new landfill in east" has not been completed due to external factors. Detailed evaluation using the targeted Objectively Verifiable Indicators in PDM is as follows:

(1) ***Indicator 1-1: Master Plan is updated by the end of the Project with 2 component projects, namely "construction of the new landfill in the East" and "Innovation of the workshops for vehicles & heavy machineries" physically completed at the rate of completion of 100% and 100% respectively.***

The target of Indicator 1-1 has been partly achieved but it is difficult to achieve 100% of completion rate by the end of the Project.
Revision of M/P was reported in Project Progress Report Nos. 7 and 8, and it will be able to complete by the end of the Project.
However, one of the "2 components projects" cannot be completed by the end of the Project. One component project, procurement of all equipment for "innovation of the workshops for vehicles & heavy machineries", which was identified as the priority project in M/P, was completed in June 2013. On the other hand, regarding the other component project "construction of the new sanitary landfill in east", civil engineering works of access road as well as designing works for the 1st phase of landfill site has been done by the time of Terminal Evaluation in March 2014 and it is difficult to achieve all of construction for landfill site within the Project period.
The delay was mainly caused by the failure to disburse budget allocated, because all construction companies were occupied by other construction works and could not find an appropriate company to enter into a contract, and also heavy equipment for construction works was not available.

(2) ***Indicator 1-2: Management process is improved in 3 aspects, Plan, Monitoring and Evaluation.***

The target of Indicator 1-2 has been already achieved under the intensive efforts of DPSC and UPPH.

To reinforce three aspects (Plan, Monitoring and Evaluation in detail) in municipal solid waste management, following efforts were made by DPSC and UPPH management bodies. Since changes to show organizational improvement have been actually made, three aspects are deemed to be improved.

Table 2: Improvement of management process on three aspects

Aspects	Contents of improvement
Plan	- DPSC and UPPH became an axis of relevant departments, and a project team was organized to integrate the procurement department, the construction department and the design department to implement projects. Weekly meetings for the organization were also regularly held to discuss budget allocation, management of the progress, etc. - Action Plan was developed to enhance the project execution capability of DPSC. - The Project Team proposed DPSC/UPPH to develop a "project planning sheet" when a new project is implemented in general.
Monitoring	- DPSC could overcome the difficult stages of material procurement by incorporating upper-level negotiation with authorities. - The Project Team proposed DPSC/UPPH to develop a "project monitoring chart" before execution when a new project is implemented in general. - For the monitoring of projects, the Project Team proposed DPSC/UPPH to submit a "Progress check sheet" at least once in a month. - In the case of having meetings such as construction, licensing procedures and contract with partner organizations for carrying out projects, the Project Team proposed DPSC/UPPH to prepare "minutes of meeting" and it should be approved by next day.
Evaluation in detail	- For project mid-term and terminal evaluation, four criteria have been developed: period of construction works, collaborations with organizations, quality of construction, and budget for construction.

Source: Prepared by Terminal Evaluation Team based on the information from progress reports

(3) ***Indicator 1-3: Quality of DPSC management-related report on plan, monitoring, and evaluation is improved by establishing two kinds of management reports.***

The targets of Indicator 1-3 have been already achieved.

In order to improve management process of DSDP and UPPH from three aspects (Plan, Monitoring and Evaluation in detail), five management-related reporting formats were

introduced such as "project planning sheet", "project monitoring chart", "Progress check sheet", "minutes of meeting" and "Indicators for project evaluation" by the Project. Among these five reporting formats, more than two kinds of management-related reports were introduced and routinely utilized by DSDP and UPPH.

(4) ***Indicator 1-4.1: Core Group: approximately 520 people are trained.***

1) ***15 Directors in technical and economic management for supervision, integrated management and work safety.***
2) ***106 Heads of Communal Zones in integrated management (waste collection-transportation-final disposal) and work safety.***
3) ***Approximately 400 technicians in integrated management (waste collection-transportation-final disposal) and work safety.***

The targets of Indicator 1-4.1 have been almost achieved but it is necessary to reinforce the activity to achieve the indicator 1-4.1 within the project period.
Until February 2014, trainings had been conducted and following number of staff attended. As for the trainings for heads of 15 administrative zones and zone chiefs, the targeted indicator was achieved in excess, 320% and 129% (see Table 3). However, for the trainings for technicians, the progress is being rather delayed, 61.3%, due to the insufficient resource inputs and delay of approval for implementation of the trainings caused by personnel change of upper level management.

Table 3: Result of trainings for DPSC staff

Target of trainings	Objective (person)	Actual (person)	Achievement (%)
Heads of 15 administrative zones	15	48	320.0
Zone chiefs	106	137	129.2
Technicians	400	245	61.3

Source: Information given by the Project Team

(5) ***Indicator 1-4.2: Manuals (Textbooks) are prepared (3 kinds)***

The target of the Indicator 1-4.2 has been already achieved.
Three manuals, "Economical management and management technics", "Comprehensive solid waste management" and "Work safety" were developed.

(6) ***Indicator 1-5.1: Solid waste education is conducted for 6 elementary schools and 2 junior high schools of the Popular Council of Miramar through the "Red de***

Formación Ambiental" while there was no such activity at the beginning of the Project.

The target of Indicator 1-5.1 has been already achieved.
Currently, solid waste education activities are regularly carried out in six primary schools and two secondary schools as follows.

Table 4: Educational organizations which conduct environmental education on solid waste management

Targets	Style of activities	Frequency
Primary school Renato Guitart Rosell Republica de Cambodia Seguidores de Ejercito Rebelde Cesareo Fernandez Martinez Solidaridad con Chile Vo Thi Than	Club activities	Every two week
	Special morning gathering	Every month
	School gardening	Every week
	Dialogues on solid waste	Every month
	Contests	Every year
Secondary school	Special morning gathering	Every month
Manuel Octavio Bisbe Alberni	Dialogues on solid waste	Every month
Anton Semionovich Makarenko	Art related activities	Every month

Source: Progress Report No.6

(7) ***Indicator 1-5.2: Solid waste education for the employees of the hotels and agricultural markets in Havana City is conducted at 10 entities while there was no such activity at the beginning of the Project.***

The target of Indicator 1-5.2 has been achieved.
At the time of terminal evaluation, trainings in the Pilot Project workshops were conducted for staff in 10 organizations.

Table 5: Number of organizations which Solid waste education were conducted

No.	Name of organizations
1	Tulipan agricultural market
2	Cerro agricultural market
3	Milagro agricultural market
4	17 y K agricultural market
5	Caballo Blanco agricultural market
6	Virgen del Camino agricultural market
7	Trigal agricultural market
8	Hotel Chateau Miramar

9	Hotel Comodoro
10	Cigarette factory

Source: Material provided by Project Team

Output 2: Solid waste source separation at Pilot Project Site is promoted and capacity of UPPH in organic waste reduction at the source is strengthened.

Summary: Applicability and effectiveness of the organic waste reduction practice through composting of source-separated biodegradable organic waste from large-scale generators are positively verified. Output 2 is basically achieved as a pilot project, and the results suggested that the composting practice for organic waste reduction will become sustainable if certain conditions are fulfilled within the project period.
Solid waste source separation at Pilot Project Sites was promoted and a pilot-scale collection system of biodegradable organic waste was established from selected generators such as agricultural markets, hotel and cigarette plant etc. However the supply of biodegradable organic waste was not stable which affects the production amount of compost. If necessary countermeasure is taken by Cuban side to stabilize the amount of collected organic waste, it is expected to achieve the targets of indicator, and the Pilot Project will become a sustainable project.

(1) ***Indicator 2-1: Organic waste for composting in Pilot Project Site is collected by 1,500 kg per day.***

The target of Indicator 2-1 can be achieved by the end of the Project, if certain conditions described below are fulfilled.
The average of amount of collected organic waste is 1,133 kg/day (as of January 2014), although the collected amount greatly varies from one day to another. This large variation was caused by following reasons:

1) A truck for organic waste collection, which is one of the JICA's donating equipment and had been damaged by a traffic accident on 28 April 2012, and there was a certain period that the truck for organic waste collection had not been available.
2) Small drum cans and containers to deposit the organic waste were insufficient.
3) At the beginning of the Project, it was planned to collect organic waste from agricultural markets and hotels. However, the amount organic waste from both sources (agricultural markets and hotels) was too small in comparison with initial expected amount.

4) The frequency of collection by UPPH was sometimes irregular mainly due to limited number of collection vehicles. Therefore organic waste was mixed and discarded as a general waste.

Though there are some problems mentioned above, there is a possibility that the indicator can be achieved by the end of the Project, if the following conditions are fulfilled and sustained:

1) UPPH allocates enough resources for collection. 2) Staffs who are aware of the importance of compost production and separate collection increase.
3) In order to stabilize the supply amount of source-separated biodegradable organic waste, DPSC has the support of the cigarette manufacturing factory that promises to provide large-scale supplies. If supply-chain is coordinated / organized with this factory, the composting project will be sustainable.
4) At present, the cost of organic waste treatment by compost production is about five times (in CUC portion) and 10 times (in CUP portion) as much as cost of direct disposal of organic waste at the final disposal site. If the produced compost will be sold as a soil conditioner, the cost-benefit balance for compost production will be improved and it is expected that the importance of compost production as means of disposing organic waste will be better understood.
5) The composting can reduce the greenhouse gas (GHG) emissions potential of organic waste, which contributes to mitigate the Climate Change issue.

(2) ***Indicator 2-2: Compost in Pilot Project Site is produced to 650 kg per day.***

Indicator 2-2 can be achieved by the end of the Project, if certain conditions are fulfilled. Since November 2011, compost was produced 667kg/day on average (in July 2013). However, the production of compost is unstable and it depends on the amount of collected organic waste. Collection of organic waste has been suffered from various problems described above (*see previous section Indicator 2-1*). However, if the conditions mentioned in the previous section "Indicator 2-1" are fulfilled successfully, daily compost production of 650kg/day on average may be possible.

(3) ***Indicator 2-3: Percentage of foreign material in organic waste to compost plant is reduced by 50 % as compared to the percentage at the beginning of the pilot project.***

Indicator 2-3 can be achieved by the end of the Project, if certain conditions are fulfilled.

As of January 2014, the proportion of the amount of foreign matter is 25.4% at agricultural markets, 2.3% at a cigarette plant and 0% at hotels (target value is 8.3%). In order to promote the source separation practice, the Project installed small drum cans for separation and large containers for non-organic waste at the agricultural markets, then the amount of foreign matters decreased once almost zero.
However, waste collection by UPPH was unstable in agricultural markets and non-organic waste was sometimes discarded in the separation container. In some agricultural markets, situation is somehow improved by means of waste separation tag installed on containers.
If the conditions as mentioned for Indicator 2-1, particularly 1) and 2) are fulfilled successfully, it may be possible to reduce the contamination of foreign matters from organic waste.

(4) ***Indicator 2-4: Behavior change of local institutions in pilot project Area on waste reduction and separated collection reaches 5 institutions while there was no such institution at the beginning of the project***

Indicator 2-4 has been already achieved.
At the time of terminal evaluation, five organizations in Pilot Project Area are joining the Pilot Project on waste reduction and separated collection practices.

Output 3: Capacity of UPPH in the collection and transportation of solid waste is strengthened.

Summary: Output 3 is likely to achieve within the project period. Even though procurement and installation of equipment for vehicle maintenance workshop was delayed, necessary equipment was procured and trainings were conducted for mechanics. As a result, all indicators to measure improvement of vehicle maintenance techniques are to be achieved by the effort of C/Ps and Japanese experts. In addition, 22 manuals were already prepared.

(1) ***Indicator 3-1: Average downtime of working collection vehicles is improved to the level of CDT (Coeficiente de Disponibilidad Técnica) at 63.2 %, to the level of TR (Time for Repair) at 8.38 hrs/month, and to the level of TE (Time for waiting to be repaired) at 5.46 hrs/month. *External factors: Spare parts and materials necessary for repair and maintenance of collection vehicles are supplied.***

The target of Indicator 3-1 is likely to be achieved by the end of the Project.
The data on the indicator 3-1 is regularly measured by C/P and the result is as follows.

Table 6: Change of average downtime of working collection vehicles (CDT), Time for Repair (TR), Time for waiting to be repaired (TE)

	Target value	Dec 2010	Mar 2012	Oct 2012	Oct 2013
CDT-1	More than 63.2%	50.7%	82.8%	81.5%	64.9%
CDT-2[1]	More than 63.2%	58.6%	85.7%	85.13%	78.7%
TR	Less than 8.38 hours	10.67 hours	6.5 hours	6.38 hours	6.38 hours
TE	Less than 5.46 hours	6.37 hours	1.67 hours	1.57 hours	1.57 hours

Source: Progress Report No. 8

At the earlier stage of measurement, namely in December 2010, there was steady improvement until October 2012. However, the value of CDT slightly decreased in October 2013, although the value still exceeded the target value. This change was caused by a limitation of availability of spare parts.

(2) ***Indicator 3-2: Frequency of waste collection and transportation by UPPH is optimized with the index of VF (Rate of Functioning Vehicle to Number of collection route) at 90% and NC (Rate of Necessity of Container to planned number of container) at 15%. * External factors: It is possible to obtain reliable weighbridge data.***

The target of Indicator 3-2 is likely to be achieved by the end of the Project.
Change of waste collection vehicle allocation rate (VF index = rate of functioning vehicles / Number of collection route) and necessary container rate (NC index = number of necessity of container / planned number of container) are as follows:

Table 7: Change of VF index and NC index for waste collecting vehicles

	Target value	2012	2013
VF index	More than 90%	71%	94%
NC index	Less than 15%	10%	16 %

Source: Progress Report No. 6 and answer of questionnaire from Project Team

[1] CDT-1 is the result of calculation for all target vehicles, while CDT-2 is the result of calculation only for vehicles excluded disused vehicles.

In 2012, NC index exceeded the target value though VF index was not achieved. Contrarily, in 2013 VF index exceeded the target value though NC index was not achieved.

Note: To accurately calculate the VF index and NC index, it was necessary to utilize the weighbridge to measure weight of waste collection vehicles, and then reexamine the efficiency of collection route and number of necessary containers. However, weighbridge installed in Calle100 was often malfunctioned and the reliable data was not available. Therefore, improvements of VF index and NC index for the Indicator 3-2 are calculated only from rate of functioning vehicles and planned number of containers, not based on the weighbridge data.

(3) ***Indicator 3-3.1: At the 7 main areas of the maintenance workshop (chassis, welding, machine tool room, tire repair shop, electricity, hydraulics, and injection lab), 20 mechanics are trained to correctly operate the equipment donated by the Project.***

The target of Indicator 3-3.1 has been already achieved.
The technicians improved their skills related to maintenance of the vehicle after receiving intensive trainings by Japanese experts and by adjunct trainings of the C/Ps, even though procurement of equipment and installation of equipment were delayed. In 2013, exams for eight main subject areas were conducted in order to measure the level attained. As a result, all of 55 technicians[2] who took exams on eight areas passed it.

(4) ***Indicator 3-3.2: Seven (7) maintenance manuals are prepared for the main areas mentioned in 3-3.1.***

The target of Indicator 3-3.2 has been already achieved.
The Project successfully prepared 22 maintenance manuals for UPPH workers as follows:

Table 8: List of maintenance manuals developed in the Project

[2] A person in charge of trainings and a person in charge of maintenance took the test more than once, and number of actual successful technicians are 50.

	Name of manuals
1	Manual for maintenance of hydraulic system
2	Manual for maintenance of clutch
3	Manual for maintenance of electric system
4	Manual for operation of arc welding
5	Manual for gas welding
6	Manual for maintenance of air tools
7	Manual for maintenance of tires
8	Manual for operation of tire changer
9	Manual for maintenance of differential gears
10	Manual for maintenance of machine tools
11	Manual for maintenance of engine cooling system
12	Manual for maintenance of engine lubrication system
13	Manual for TIG welding machine
14	Manual for maintenance of engine fuel system
15	Manual for maintenance of engine intake and exhaust system
16	Manual for safety and hygiene works
17	Manual for operation of fuel injection pump tester
18	Manual for engine maintenance
19	Manual for operation of greasing pump
20	Manual for maintenance of brake
21	Manual for maintenance of steering, accelerator and suspension
22	Manual for maintenance of transmission

Source: Progress report No.8 and answer of questionnaire from Project Team

Output 4: Capacity of UPPH and DPSC on landfill design and operation of final disposal sites is strengthened.

Summary: Output 4 is partly achieved but it is difficult to achieve completely within the Project period.

During the designing stage of a new landfill site, valuable recommendations were made by Japanese expert and the designing of new landfill site were improved. For improvement of management capacity of existing final disposal site, a monitoring was carried out and progress was seen to some extent. However the level of improvement did not attain expected level due to suspension of the construction process of new sanitary landfill caused by lack of resources.

(1) ***Indicator 4-1: The existing final disposal sites are properly operated and managed in dumping, surface compaction, soil cover, slope protection and leachate treatment at 3 sites while only 1 site at the beginning of the Project.***

The target of Indicator 4-1 can be partly achieved by the end of the Project.
As for monitoring the improvement of existing disposal site, second monitoring was carried out in 2014 for 15 items on improvement situation of existing disposal sites. The result is as follows.

Table 9: Improvement situation of existing disposal sites

	Calle100		Ocho vias		Tarara		Campo Florido	
	ST*	EV*	ST	EV	ST	EV	ST	EV
Outsider intrusion	1	1	1	1	1	1	1	1
Administration office	1	1	0	1	1	1	0	0
Scale**	0.5	1	0	0	0	0	0	0
Lighting	0	0	0	0	0	0	0	0
Fire preventive equipment	1	1	1	1	1	1	0	0
Inside road pavement	1	1	1	0	1	1	1	1
Allocation of record keepers for collection vehicles	1	1	1	1	1	1	1	1
Waste compaction**	1	1	1	1	1	1	0.5	1
Slope Protection	1	1	1	1	1	1	0	0
Implementation of covering soil		0.5		0.5		0.5		0.5
Areas covered with soil	1	1	1	1	1	1	1	1
Leachate treatment	0	0	0	0	0	0	0	0
Valuable waste collection	1	1	1	1	1	1	1	1
Compost production	1	1	0	0	0	0	0	0
Utilization of biogas/degassing	1	1	0	0	0	0	0	0
Score	11.5	12.5	8	8.5	9	9.5	5.5	6.5

*ST: Starting Situation, EV: Situation at the Second Evaluation conducted on 14th March 2014
** In case, scale exists but is not function, the score is 0.5.
*** In case, waste compaction is not carried out every day, the score is 0.5.
Source: Project team

In the evaluation, disposal sites which are more than 11 points are regarded as an environmental friendly final disposal site. A disposal site which exceeded 11 points was only Calle 100. The leachate treatment was not installed in all four dumping sites which is a future challenge in particular for Calle 100.
Monitoring was continued by C/Ps and Japanese experts and some progress was seen in three final disposal sites except Campo Florido. Therefore, it is difficult to prospect improvement of all of the four landfill/final disposal sites within the project period.
Since remaining years in service are two years for Ocho vias, Tarara and Campo Florido (Progress report No.8), it is necessary to consider whether all disposal sites really need to achieve all evaluation items under limited resources and budget.

(2) *Indicator 4-2: The design of New Landfill in East is revised in an environmentally friendly way for 11 improvements while 0 at the beginning of the Project.*

The target of Indicator 4-2 has been already achieved.
After the training in Mexico in December 2012, modification of design were conducted; modification of number of cell taking into account improvement in lining works and service life of each cell (the number of compartments has been modified from six to four), modification of cell figures taking into account sequence of cell construction and final shape of landfill, and changing embankment materials into more cost-effective ones. A number of outputs (design plan) which reflected the improvements were counted as 12. Besides, according to the interview survey with a designing company DCH, recommendation made by Japanese experts exceed more than the value below if minor improvements are included. Therefore improvement of 11 items in the indicator has been already achieved.

Table 10: Number of improved outputs

No	Improved items	Target organization	Number of improved outputs*	
			1st Evaluation	2nd Evaluation
1	Improved items on designing from the beginning of the project to the time of evaluation	DCH[3]	2	5
		EIPHH	1	3
		IPROYAZ	0	0
2	Progress management	DCH	1	1
		EIPHH	1	1
		IPROYAZ	1	1
3	Improvement or change during the construction period	DCH	0	0
		EIPHH	0	0
		IPROYAZ	1	1
Improved number			7	12

* First Evaluation: 7th July 2014, Second Evaluation: 14th March 2014
Source: Project team

3-1-3 Prospect for Achievements of the Project Purpose

Project purpose: Capacity of DPSC on urban solid waste management in Havana City is strengthened through collaboration among cooperative organizations.

[3] DCH, EIPHH and IPROYAZ are the name of state designing companies.

The Project Purpose is likely to be achieved by the end of the Project if appropriate efforts from Cuban side continue.
Capacity of DPSC on urban solid waste management in Havana is strengthened through collaboration among cooperating organizations in each Output. Although Output 1 has not fully been achieved, it is expected to be improved by the end of the Project if there are appropriate efforts of Cuban side.

(1) ***Indicator 1: The training program is formulated and begins to be implemented for DPSC/UPPH's members based on the experience with the trained Core Group regarding Output-1***

The target of Indicator 1 is likely to be achieved by the end of the Project.
Based on the results of the questionnaire survey for DPSC staff, training programs for staff were formulated. The training for the core group was conducted based on the program, and the experience has been accumulated in DPSC. Progress of training for technicians is slightly delayed but the effect spreads even to non-core group through voluntary programs which were carried out by DPSC. Through such trainings, cooperation with 15 administrative districts in Havana and DPSC zone chiefs was enhanced steadily.

[Additional indicator for Output 1][4] Capacity of DPSC staff is strengthened for integrated solid waste management through the activities:

There have been collaboration with relevant organizations through such activities as development of action plan, monitoring activities and evaluation, cooperation with six primary schools and two middle schools in the pilot area through solid waste education with collaboration with CITMA and nine organizations.
Therefore solid waste management capacity of DPSC was enhanced through collaboration with partner organizations. The progress can also be observed from the result of the capacity assessment conducted by the Project in March 2014 as shown in Annex 9. At the initial stage of the Project, most of the assessment capacity levels were rated as 1.5-2.0 out of 5.0 in score.

[4] This indicator has been added by the Joint Evaluation Team in order to verify the Output 1 appropriately.

However, according to the final evaluation conducted in March 2014, most of the levels became as 4.0-5.0 in score, which showed that the capacity of DPSC has been significantly enhanced.

(2) ***Indicator 2: Organic waste reduction achieved in the pilot project (to be about 1.5 ton/day) to be maintained regarding Output-2***

The Output 2 is basically achieved as a pilot project for verification of applicability and effectiveness of waste reduction through composting of organic waste from large-scale generators, but the exact achievement of quantitative indicator. "about 1.5 ton/day". is uncertain.

At the time of terminal evaluation, average 1,133 kg/day of organic waste was collected and compost was produced, although it has not achieved the target value of 1.5 ton/day yet. However, experience and new findings on compost production were accumulated through the process of the pilot project. The utilization of cigarette rubbish for composting is new finding by the Project. Cooperation system among UPPH, hotels, agricultural markets, and cigarette plant was also established.

Even there have been difficulties to collect sufficient the organic waste from hotels and agricultural markets, the Project found other sources such as cigarette rubbish, pruning waste and fallen leaves etc. Techniques to produce compost were successfully transferred from Japanese Expert to C/Ps and produced compost was used for horticulture by municipality.

If the conditions mentioned in the section of Indicator 2-1 for Output 2 are fulfilled, there is a possibility to achieve the quantitative indicator.

(3) ***Indicator 3: Vehicle repair and maintenance system upgraded (about 10% reduction of time required for several representative repair/maintenance works in the Workshop) by trained mechanics using equipment donated by the project to be maintained***

The target of Indicator 3 is likely to be achieved by the end of the Project.

The time required for the major repair and maintenance is reduced on the following major repair works by procurement of the equipment and implementation of training in the Project, and also strengthening the overall maintenance facilities by the Cuban side etc.

Through construction of such facilities and installation works, coordination capabilities of DPSC/UPPH with contractors and other organizations were also improved.

Table 11: Change of necessary time for major repair and maintenance works

	Necessary time before the Project implementation (hour)	Necessary time after the Project implementation (hour)*	Rate of Improvement
Welding works of container lifter	3.0	1.05	65% reduction
Repair of clutch	3.45	2.1	39% reduction
Repair of tire	1.2	0.3	75% reduction
General greasing work	1.1	0.25	77% reduction

Source: Progress Report No. 7

All of the works showed significant time savings compared with the target value "10% of time reduction"[5].

(4) ***Indicator 4: Improvement of collection and transportation by means of the upgraded CDT and frequency optimization (productivity per liter of oil is expected to reach 0.90m³/L as compared to the 2008-09 level of 0.80m³/L) to be maintained regarding Output-3***

The target of Indicator 4 is likely to be achieved by the end of the Project.
The target value was set for loaders/flat trucks as representing vehicles. According to the progress report, original value was 0.80m³/L and it was currently improved by 0.83m³/L. Effort of improvement will be continued on improvement of productivity per liter after this.

(5) ***Indicator 5: Environmentally friendly landfill design advised by JET is incorporated into the new East Landfill to be constructed regarding Output-4***

[5] For measuring the required time for maintenance, same contents of maintenance procedure were set in each fields and the working time was measured for 1) time without procured equipment (as required time before start of the Project) and 2) time with procured equipment (as required time after the Project), and the change rate was calculated. Basically, time was measured once each (some time twice under different conditions). The number of person is depending on the type of works

The target of Indicator 5 is likely to be achieved by the end of the Project. Environmentally friendly landfill technologies advised by Japanese Expert were reflected mainly to 12 items in the design of eastern final disposal site.

3-1-4 Prospect for Achievement of the Overall Goal

Overall Goal: Urban solid waste management is properly implemented in Havana City and sanitary environment of the City is improved.

It is expected that the Overall Goal to be achieved within 3-5 years if proper input will be made by Cuban side.
Even at the time of terminal evaluation, one indicator out of four is already achieved. Rest of three indicators is also expected to be achieved in the near future if there is a commitment from upper level organization in Cuba for proper resource allocation.

(1) ***Indicator 1: Volume of primary materials recovered from waste in Havana City reaches 6,400 tons/year from the current level of 4,000 tons/year.***

The quantitative target of Indicator 1 is difficult to be achieved within 3-5 years after the end of the Project if current situation continues.
The amount of primary material recovery measured by UPPH was 5,300 tons/year in 2011 and 6,100 tons/year in 2012, which were encouraging results for achieving the target. However, it was 3,600 tons/year in 2013 and was significantly decreased.
The reason for the decrease in 2013 is most probably caused by a recycling policy change of the Government of Cuba. State-owned recycle enterprise (*Matiria Prima*) started to buy recyclables directly from general public. As a result, general public or waste pickers tended to sell the recyclables collected from final disposal sites or streets, and the collection amount by UPPH became decreased.
It means the quantitative indicator only measured by UPPH is probably no longer valid under current recycling policy, but from the view point of urban solid waste management mentioned in Overall Goal, present tendency is positively evaluated because the recovery of primarily materials is enhanced when collections both from UPPH and general public are implemented.

(2) ***Indicator 2:*** ***Over 2 entities in Havana City consider introducing waste reduction model practiced in Pilot Project while there was no entity at the beginning of the Project.***

The target of Indicator 2 is expected to be achieved in 3-5 years after the end of the Project.

Currently, one organization (UPPH) is participating in the pilot project for production of compost. During the pilot project, it was found that organic waste like cigarette rubbish, pruning waste and fallen leaves, which does not compete with pig farming companies, could be a source for compost and there is a possibility to introduce the waste reduction model at new landfill sites in the future.

(3) ***Indicator 3:*** ***Number of environmentally friendly final disposal landfill sites which are properly maintained is more than 2 at the end of the Project while there was only 1 at the beginning of the Project.***

The target of Indicator 3 is expected to be achieved within 3-5 years after the end of the Project.
At the time of terminal evaluation, the final disposal site in which appropriate maintenance is carried out is only Calle100. If construction of new Guanabacoa sanitary landfill is realized on schedule, the quantitative target of the indicator can be undoubtedly achieved. At the time of terminal evaluation, a construction company has already been selected and is waiting for signing of contract for construction of new sanitary landfill, and it is expected to start the construction in near future.

(4) ***Indicator 4:*** ***The level of satisfaction among Havana's citizens in terms of the integrated solid waste management increases. As a representative indicator, the reduction in the number of complaints is used. The number of complaints decreased from 60/year/municipality to 36/year/municipality.***

The target of Indicator 4 has been already achieved.
There were no municipalities in all 15 municipalities of Havana city where number of complaints is counted for more than 36 items per year (from June 2012 to March 2013).

3-1-5. Summary of Achievements of the Project

The achievement level on each Output, Project Purpose and Overall Goal are summarized as follows:

Output1 Summary	Likely to be achieved mostly within the project period.
Indicator 1-1	Partly achieved but it is difficult to achieve 100% of completion rate by the end of the Project.
Indicator 1-2	Already achieved
Indicator 1-3	Already achieved
Indicator 1-4.1	Almost achieved but it is necessary to reinforce the activity within the project period.
Indicator 1-4.2	Already achieved
Indicator 1-5.1	Already achieved
Indicator 1-5.2	Already achieved
Output 2 Summary	Basically likely to be achieved as a pilot project
Indicator 2-1	Can be achieved by the end of the Project, if certain conditions described below are fulfilled
Indicator 2-2	Can be achieved by the end of the Project, if certain conditions are fulfilled
Indicator 2-3	Can be achieved by the end of the Project, if certain conditions are fulfilled.
Indicator 2-4	Already achieved
Output 3 Summary	Likely to be achieved by the end of the Project
Indicator 3-1	Likely to be achieved by the end of the Project
Indicator 3-2	Likely to be achieved by the end of the Project
Indicator 3-3.1	Already achieved
Indicator 3-3.2	Already achieved
Output 4 Summary	Partly achieved but it is difficult to achieve completely within the Project period
Indicator 4-1	Can be partly achieved by the end of the Project
Indicator 4-2	Already achieved
Project Purpose	Likely to be achieved by the end of the Project if appropriate efforts from Cuban side continue
Indicator 1	Likely to be achieved by the end of the Project
Indicator 2	Basically achieved as a pilot project, but the exact achievement of

	quantitative indicator, "about 1.5 ton/day", is uncertain.
Indicator 3	Likely to be achieved by the end of the Project
Indicator 4	Likely to be achieved by the end of the Project
Indicator 5	Likely to be achieved by the end of the Project
Overall Goal	To be achieved within 3-5 years if proper input will be made by Cuban side
Indicator 1	Difficult to be achieved within 3-5 years after the end of the Project if current situation continues
Indicator 2	Expected to be achieved within 3-5 years after the end of the Project
Indicator 3	expected to be achieved within 3-5 years after the end of the Project
Indicator 4	Already achieved

3-2 Implementation Process of the Project (1) Project Management System

Regular meetings and JCC were functioning for the recognition of problems. However, those problems which exceeded the responsibilities of the JCC members could not be solved.

During the stay of Japanese experts, communication between Japanese Experts and C/Ps are properly made. Proper system of command chain and well-defined management structure are established for both Japanese Expert's side and C/P team's side.

Even though there were some changes of directors in DPSC/UPPH, the Project Manager continued her job during the Project period, which ensured the stability and continuity of the project management. Therefore the implementing structure was secured.

(2) Ownership of the Project

In general, the ownership of the Project is high for Cuban side. Cuban C/Ps adequately participate the Project activities in collaborative manner during the stay of Japanese Experts.

Cuban side budget was spent for the construction of infrastructure required for installation of procured equipment, improvement of vehicle maintenance facilities, improvement of heavy equipment maintenance facility and construction of compost yard.

However, even though C/Ps could secure the budget, it was not executed as scheduled.

4. Results of the Evaluation

4-1 Results of the Evaluation based on the Five Criteria

Results of five criteria evaluation are summarized in five ratings. The highest rate is "high", and followed by "relatively high", "moderate", "relatively low" and "low".

4-1-1 Relevance

Relevance of the Project is high as following reasons.

(1) Consistency with policy in Cuba

The Project is consistent with the waste -related policies in Cuba.

In the "National Environmental Strategy2007-2010" of Cuba, waste management is positioned as prioritized area.

(2) Needs

The Project focused on capacity development is consistent with the needs of the target group.

Under the circumstance in which spare parts are not easily procured, there is a high relevancy to provide equipment to improve capacity concerning maintenance of vehicles and heavy machineries.

However, so far, human resource development program has not been systematically planned nor implemented. Under such situation, various insufficient capacities are observed not only in technical level, but also in organizational structures, institutional /socio-economic system prevent proper implementation of the M/P, before the implementation of the Project. Therefore, the need for the Project is considered to be high.

(3) Consistency with policy of Japan

The Project is consistent with Japan's aid policy.

Environmental sector is one of the prioritized areas in the official development assistance (ODA) policy for Cuba. In addition, it is consistent with the aim of "3R initiative" which Japan is actively promoting in the international community. Therefore, validity is high in terms of diplomatic policy.

4-1-2 Effectiveness

Effectiveness of the Project is relatively high as following reasons:

(1) Achievement level of Project Purpose

The Project Purpose is likely to be achieved by the end of the Project if there are appropriate efforts from Cuban side.

The Project Purpose, "Capacity of DPSC on urban solid waste management in Havana City is strengthened through collaboration among cooperative organizations", coordination capability of DPSC/UPPH on collaboration with other relevant organizations is strengthened in each Output.

Although Output 1 has not been fully completed yet, it is expected to be improved by the end of the Project. In order to achieve the Project Purpose, it is essential that financial arrangement from Cuban side is assured such as preferential allocation of budget for waste collection vehicles for organic waste collection and commencement of construction for new Guanabacoa final disposal site.

(2) External factors inhibiting or contributing to achieve the Project Purpose

Factors inhibiting to achieve the Project Purpose

1) Cooperating generators like the hotels or the agricultural markets became less interested in pilot project when UPPH could not serve regular collection of organic waste for Output 2.

UPPH could not implement regular collection because of the following reasons;

a) The vehicle donated by JICA had been breakdown by an accident and during the vehicle was being repaired, and until UPPH arranged an alternative vehicle, collecting activity halted for some period; and

b) The Project launched another system of collection using large containers and UPPH's compactor trucks. However, since UPPH's compactor trucks had to prioritize routine collection route, collection for the pilot project was not implemented as it was planned.

2) Construction of new Guanabacoa landfill site never started as of 2014 March, the Japanese Expert Team could not give an advice on design adjustment along with process of construction works. This situation also hindered C/Ps from opportunities to strengthen their capacity of coordination.

Factors contributing to achieve the Project Purpose

1) The Project is designed in accordance with the M/P "The study on integrated management plan of municipal solid waste in Havana city" developed by Japanese cooperation. Therefore, the Project addresses problems in municipal waste management of Havana in a comprehensive manner.

2) Project period was decided to extend for 19 months after the mid-term review in October, 2011. This extension enabled Japanese Experts and C/Ps to transfer knowledge after all equipment had been installed, and also enabled to take a long stance to tackle with the many challenges.
3) Continuous and stable participation of UPPH counterparts to the Project greatly contributed to the technology transfer program on maintenance of vehicles and heavy machineries.

4-1-3 Efficiency

Efficiency of the Project is moderate under given conditions as following reasons:

(1) Contribution of Activities and Inputs

Delay occurs in the activities for following reasons and sufficient Outputs could not be gained in the initial project period. To this end, the project period was extended one and half year.

1) Regarding construction of compost yard for pilot project, the site of the compost yard was changed and it spent a long time to get approval for the new site.
2) Regarding installation of the equipment in the workshop, there were some problems such as procurement of the equipment was divided into three phases due to a matter of JICA's internal procedures and it became more difficult to install an environment for technical transfer at once.
3) Construction works of new landfill site were not progressed because:
    a) All construction companies were occupied by other construction works and could not find an appropriate company;
    b) The budget for construction was not executed; and
    c) Heavy equipment for construction was not available. These circumstances hindered Japanese Experts to advice on how to adequately adjust design along with construction works.

(2) Appropriateness of Inputs

1) Procurement of equipment

The specifications, types and quantities of procured equipment were appropriate. The reasons of the delay were delay of installation works by Cuban side and delay of tender process by Japanese side. The delay of installation works by Cuban side was caused by difficulties of procuring some materials from local market. During the pre-survey period for selecting equipment, it should have secured the procurement period adequately also

should have investigated whether it is possible to procure the materials or equipment locally.

2) Assignment of Cuban C/Ps

Considering Cuban constraints, the number, the position and the competencies of C/Ps are appropriate. However, there is also a problem due to frequent changes of C/Ps without taking over the predecessor's duty, the results of technical transfer may not remain adequately.

3) Local cost supported by Cuban side

Budget was executed by Cuban side on infrastructure required for installation of procured equipment, improvement of vehicle maintenance facilities, improvement of heavy equipment maintenance facility and construction of compost yard.

(3) Cost efficiency

Comparing with the similar projects, the Output and the Project Purpose are commensurate with the input costs. Results of the Project are expected to sustain because of trained C/Ps, procured equipment, manuals etc. Compared to other projects, the level of the cost efficiency of the Project has been considered as relatively high. ..

4-1-4 Impacts

Impact of the Project is relatively high from following reasons.

(1) Probability of Achievement of Overall Goal

The indicator for the Overall Goal is likely to be achieved in 3-5 years if proper input will be made by Cuban side.

Even at the time of terminal evaluation, one indicator out of four is already achieved. Cuban side well understands what they should do and rests of three indicators are also expected to be achieved in the near future, if resources are timely allocated..

(2) Concept Design of new west sanitary landfill

In the course of Project activities for Output 4, the concept designing for the west sanitary landfill was also improved as a byproduct of technical transfer program.

(3) Maintenance of vehicles in other provinces

The maintenance techniques improved by the Project contributed to secure the maintenance of collection vehicles in other provinces in Cuba. About 70% of vehicles in Santiago and Holguin provinces have been repaired in the UPPH workshop.

(4) Impact on the Environmental Strategy of Havana city

Based on the experience of the Project, the ideas of waste reduction, composting, sanitary landfill, proper implementation of municipal solid waste management, and environmental education were reflected to the Environmental Strategy of Havana city which was recently established.

(5) Nation-wide Impact

DPSC is going to disseminate the concept of sanitary landfill and training contents to other provinces, which will be the first step to influence at national level. Although the Project is implemented in Havana city, the impact is expected in national level, because the Project is monitored by two ministries; namely MINCEX and CITMA.

4-1-5 Sustainability

Sustainability is moderate seeing from four aspects; (1) Policy Aspect, (2) Organizational Aspect, (3) Financial Aspect, and (4) Technical Aspect.

Note: Other than evaluation from the point of these four aspects, "Evaluation of the Sustainability of the Activities" was conducted in the Project in February 2014, and is shown as Annex 10. This evaluation of sustainability addresses "Strength, Weakness, Opportunities, and Risks" in which each activity entails, and suggests significant implications for sustainability of the Project.

(1) Policy Aspect

Sustainability of political and institutional aspect is high in the Project.

In "National Environmental Strategy 2007-2010" of Cuba, solid waste management is priority issue and possibility of support from political aspects is high.

(2) Organizational Aspect

Sustainability of organizational aspects is moderate in the Project.

During the project period, there has been many C/Ps' change. In addition, available human resources were limited. If this situation continues, it is difficult to sustain the Project's effect.

On the other hand, technicians from state-owned designing companies were involved in the Project since beginning and also participated in the third country trainings held in Mexico. Their planning capacity on landfill site has improved. Since the companies

engage in the projects in other areas in Cuba, it could be possible to disseminate the technique and know-how gained in the Project to a whole nation.

(3) Financial Aspect

Sustainability of financial aspect is moderate in the Project.

In the Project, the budget for renovation of the vehicle maintenance facility and installation of equipment procured by JICA were borne by Cuban government. It is expected to continue such budget allocation.

In addition, there are special circumstances that it was difficult to procure materials due to the lack of commodity even if there are budgets. Therefore, the securing of financial resources sometimes does not lead to ensure the sustainability.

(4) Technical Aspect

Sustainability of the technical aspect is moderate in the Project.

During the implementation period of the Project, there was frequently change of C/Ps in some Output groups. Although individual capacity of the C/Ps is high, the transferred technology may not be sustained so easily.

Due to the limitations in Cuba, Some materials and equipment were difficult to procure. Therefore, the risk lies in a problem on the system of procurement of spare parts after the end of the Project.

5. Conclusions

At the time of terminal evaluation in March 2014, it is likely that most of the Project Purpose will be achieved even though there have been some difficulties through a course of the Project.

For Output 1, improvement of comprehensive management capacity on solid waste of DPSC has been attained and various capacities have been enhanced.

For Output 2, precious experience and findings on compost production have been accumulated through the process of the pilot project. Cooperation system between UPPH and hotels, agricultural markets, and cigarette factory has been also established.

For Output 3, the time required for the major repair and maintenance was reduced on the major repair works by procurement the equipment and implementation of training in the Project, even though procurement and installation of equipment for vehicle maintenance workshop had delayed.

For Output 4, valuable suggestions were made by Japanese Expert and the design of the new disposal site was improved into new sanitary landfill site during the designing stage..

On the other hand, since construction of new Guanabacoa landfill site had delayed, the Project could not take an opportunity to transfer the know-how on how to modify the design along with construction works. This construction of the new landfill is an essential part of improving the solid waste management in Havana as addressed in the M/P. It is necessary to complete the construction of the new landfill site in a timely manner through Cuban side's own effort.

It is necessary to consider how to secure a system of the sustainability after the termination of the Project between Cuban side and Japanese side.

6. Recommendations

The Team recommends the following points:

[A] Short-term Recommendations (by the end of the Project)

(1) Sustainable operation and management of vehicle maintenance workshop

The Project had gained technical improvement in vehicle maintenance workshop. In order to use this facility effectively, Cuban side will need to procure spare parts in a stable way. DPSC/Cuban Government should ensure to provide necessary budget to procure spare parts. To help procurement process by Cuban side, it is recommended to conduct following activities under the Japanese Experts' assistance before termination of the Project period:

- To categorize tools and equipment according to the kinds of possible suppliers of spare parts. Such categories include, for example, a) items to be purchased in local market, b) items to be imported from other countries' suppliers which are easy to trade between Cuba, and c) items to be imported exclusively from Japanese or international suppliers.
- To exercise some techniques in the manuals on how to slow the deterioration or how to maintain the equipment to avoid the breakdown in order to diminish times of changing spare parts.
- To continue taking a record of break-down in a systematic way
- In order to secure above mentioned activities in well-organized manner, a department (or direction) responsible for machinery and equipment maintenance, especially those installed by the Project, is recommended to set in UPPH.

(2) Training for technicians

Some number of technical staff to be trained has not yet achieved the targeted quantitative indicator, it is recommended to organize a training course for technicians by the end of the Project.

[B] Middle -term Recommendations (after the completion of the Project)

(3) Update of manuals

It is recommended that the manuals prepared under the Project be updated as necessity rises in the future.

(4) Continuation of the construction process of landfill site

The construction of new Guanabacoa final disposal site is essential factor to improve the solid waste management in Havana as addressed in the M/P. Cuban side should continuously negotiate to push forward the process and complete the construction of new sanitary landfill site.

(5) Dissemination of knowledge and skills to other provinces

The experience and know-hows that C/P obtained through the Project, namely; ones related to maintenance and repair of collection vehicles, management of the pilot project for production of compost, design of landfill site, etc., will be needed in other provinces for better solid waste management in the future.

DPSC/Havana Province is recommended to transfer the knowledge and skills to other provinces in collaboration with the CITMA, and related institutions.

(6) To Achieve Overall Goal

In order to achieve the Overall Goal, DPSC should disseminate the Master Plan of Integrated solid waste management in Havana city updated by the Project (updated M/P) to all the stakeholders. DPSC should also plan to realize the priority projects proposed by the updated M/P under the consensus with relevant organizations. In the course of planning and realization, Cuban side authority should take necessary measures to fulfill important pre-condition such as:

a) Appropriate budget for solid waste management in Havana;

b) High priority on solid waste management in environmental sector

7. Lessons Learnt

(1) Continuous and appropriate utilization of equipment

With regard to continuous and appropriate utilization of equipment, it is necessary to consider not only securing adequate period for procurement but also taking into account possibility of replacing, repair by Cuban own effort after the Project's completion.

(2) Participation of the Cuban Experts to the Third Country Training

In the Third Country Training held in Mexico in December 2012, C/Ps and construction designers in a state-owned design enterprise participated in the trainings.

Participation of the on-site workers in the Project to the Third County Training Program was quite effective to promote technology transfer in the Project. This opportunity allowed the participants to be more motivated to improving their tasks after the training. Therefore, Japanese side recommends that Cuban side expert/practitioners in solid waste management should actively participate to overseas training, which is expected to have a synergy effect of local program and overseas program.

(3) Giving an incentive for C/Ps

During the project period, there was some instability regarding C/P members. Therefore it is necessary to find right motivations or incentives which guarantee the staff stability.

(4) Importance of Setting Indicators

To verify the achievement of the Outputs and Project Purpose, the indicators defined by present PDM were not very logically structured. In order to verify the achievements of the Outputs and Project Purpose, as pointed out in Mid-term review, the timing of setting indicators should be set in early stage of the Project. However, in this Project, even in the time of the Mid-term review, the indicator setting was not fully completed, and it resulted in loss of sufficient internal examination on validity of proposed indicators.

[End of Document]

Annex I

Project Design Matrix (PDM 4)

Project Title: Improvement of the Capacity on Urban Solid Waste Management in Havana City, the Republic of Cuba

Implementing Agency: DPSC *including UPPH

Period: 5 years

Cooperative Organizations: CITMA Habana, DMSC, Water Resource Institute, Soil Institute of the Ministry of Agriculture, Sanitary Research Institute of the Ministry of Health, etc

Project Site: Havana City　　Pilot Project Site: Miramar Neighborhood in Playa Municipality

Date of modification : June 21, 2012

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal	OG1 Volume of primary materials recovered from waste in Havana City reaches 6,400 t/y from the current level of 4,000 t/y.	Survey on solid waste, DPSC's records and reports	Appropriate budget for SWM in Havana City is ensured.
Urban solid waste management is properly implemented in Havana City and sanitary environment of the City is improved.	OG2 Over 2 entities in Havana City consider to introduce waste reduction model practiced in Pilot Project while there was no entity at the beginning of the Project.	DPSC's records and reports	Cuban Policy, putting priority on SWM in environmental sector, is continued.
	OG3 Number of environmentally friendly final disposal landfill sites which are properly maintained is more than 2 at the end of the Project while there was only 1 at the beginning of the Project	DPSC's records and reports	Fuel necessary for SWM in Havana City as a whole is supplied in a stable manner
	OG4 The level of satisfaction among Havana's citizens in terms of the integrated solid waste management increases. As a representative indicator, the reduction in the number of complaints is used. The number of complaints decreased from 60/year/municipality to 36/year/municipality.	DPSC's records (Consumer Service Department)	
Project Purpose	PP1 5 improved activities on urban solid waste management are undertaken and being established during the final 12 months of the Project. Namely; (i) The training program is formulated and begins to be implemented for DPSC/UPPH's members based on the experience with the trained Core Group regarding Output-1; (ii) Organic waste reduction achieved in the pilot project (to be about 1.5 ton/day) to be maintained regarding Output-2; (iii) Vehicle repair and maintenance system upgraded (about 10% reduction of time required for several representative repair/maintenance works in the Workshop) by trained mechanics using equipment donated by the project to be maintained, and (iv) Improvement of collection and transportation by means of the upgraded CDT and frequency optimization (productivity per liter of oil is expected to reach 0.90m^3/L as compared to the 2008-09 level of 0.80m^3/L) to be maintained regarding Output-3; and (v) Environmentally friendly landfill design advised by JET is incorporated into the new East Landfill to be constructed regarding Output-4.	DPSC's records and reports, Project records	
Capacity of DPSC on urban solid waste management in Havana City is strengthened through collaboration among cooperative organizations.			
Outputs			
1 Comprehensive management capacity on solid waste of DPSC is improved.	1-1 Master Plan is updated by the end of the Project with 2 component projects, namely "construction of the new landfill in east and innovation of the workshops for vehicles & heavy machineries" physically completed at the rate of completion of 100% and 100% respectively.	Revised Master Plan, Project records	
	1-2 Management process is improved in 3 aspects.	DPSC's records, Project records	
	1-3 Quality of DPSC management-related report on plan, monitoring, and evaluation is improved by establishing 2 kinds of management reports.	Project records, DPSC's records	
	1-4.1 Core Group: approximately 520 people are trained. 1) 15 Directors in technical and economic management for supervision, integrated management and work safety. 2) 106 Heads of Communal Zones in integrated management (waste collection-transportation-final disposal) and work safety. 3) Approximately 400 technicians in integrated management (waste collection-transportation-final disposal) and work safety.	Project records	
	1-4.2 Manuals (Textbooks) are prepared (3 kinds)	DPSC's records and reports	
	1-5.1 Solid waste education is conducted for 6 elementary schools and 2 junior high schools of the Popular Council of Miramar through the "Red de Formación Ambiental" while there was no such activity at the beginning of the Project.	Project records	
	1-5.2 Solid waste education for the employees of the hotels and agricultural markets in Havana City is conducted at 10 entities while there was no such activity at the beginning of the Project	Project records	
2 Solid waste source separation at Pilot Project Site is promoted and capacity of UPPH in organic waste reduction at the source is strengthened.	2-1 Organic waste for composting in Pilot Project Site is collected by 1500 kg per day.	DPSC's records, Project records	
	2-2 Compost in Pilot Project Site is produced to 650 kg per day.	Project records, record of the study result of the Soil Institute of the Ministry of Agriculture	
	2-3 Percentage of foreign material in organic waste to compost plant is reduced by 50 % as compared to the percentage at the beginning of the project.	Project records	
	2-4 Behaviour change of local institutions in Pilot Project Area on waste reduction and separated collection reaches 5 institutions while there was no such institution at the beginning of the project.	Project records, cases of behaviour change of local residents in Havana City	
3 Capacity of UPPH in the collection and transportation of solid waste is strengthened.	3-1 Average downtime of working collection vehicles is recovered to the level of CDT (Coeficiente de Disponibilidad Técnica) at 63.2 %, to the level of TR (Time for Repair) at 8.38 hrs/month, and to the level of TE (Time for Waiting to be repaired) at 5.46 hrs/month. * External factors: Spare parts and materials necessary for repair and maintenance of collection vehicles are supplied.	Maintenance workshop's records, Project records	

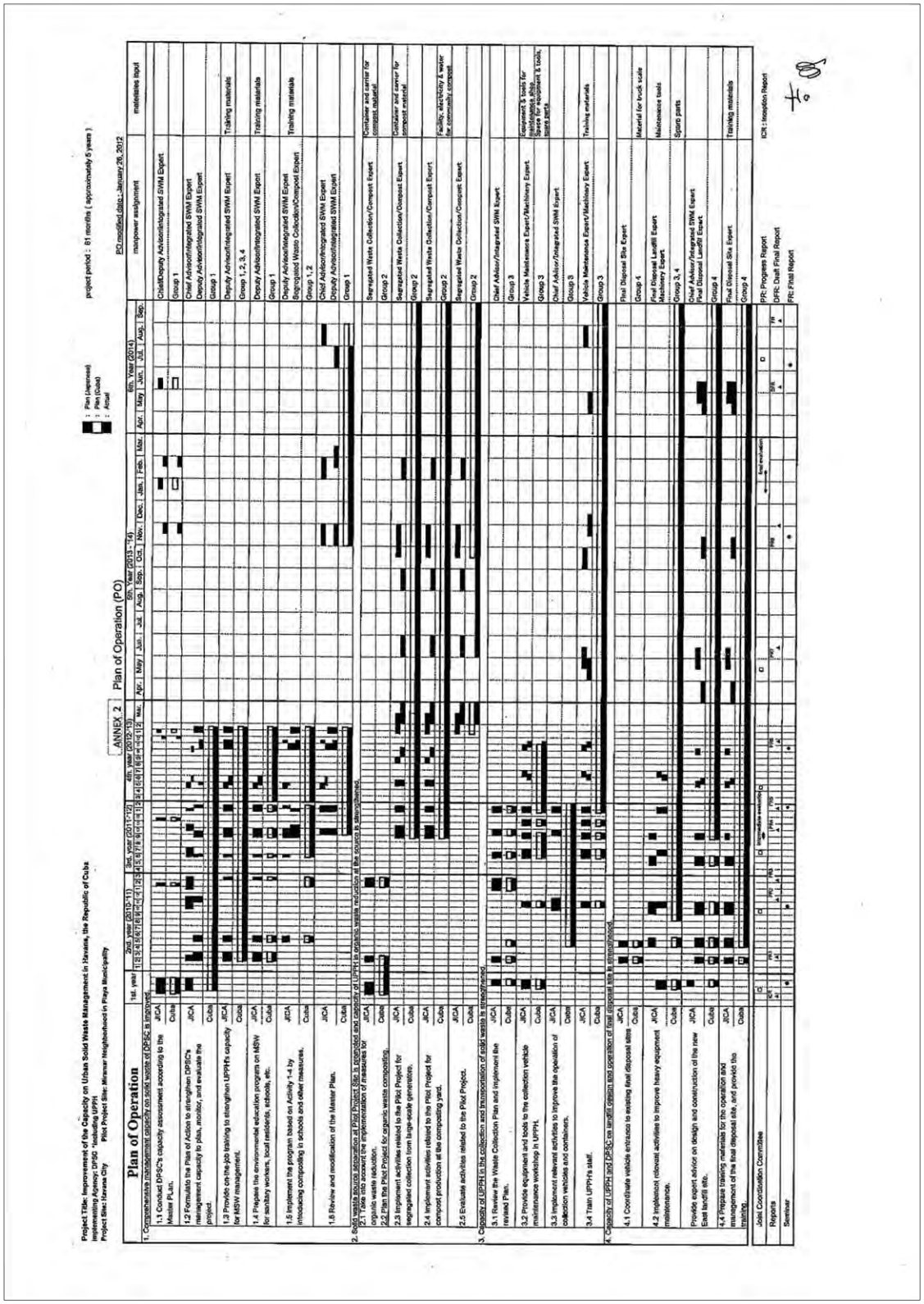
	3-2 Frequency of waste collection and transportation by UPPH is optimized with the index of VF (rate of Functioning Vehicle to Number of collection route) at 90% and NC (rate of Necessity of Container to planned number of container) at 15%. * External factors: It is possible to obtain reliable weighbridge data.	The results of self-evaluation of UPPH, records of the Customer Service Department, DPSC	
	3-3.1 At the 7 main areas of the maintenance workshop (chasis, welding, machine tool room, tire repair shop, electricity, hydraulics, and injection lab), 20 mechanics are trained to correctly operate the equipment donated by the Project.	Project records	
	3-3.2 Seven (7) maintenance manuals are prepared for the main areas mentioned in 3-3.1.	Project records	
4 Capacity of UPPH and DPSC on landfill design and operation of final disposal sites is strengthened.	4-1 The existing final disposal sites are properly operated and managed in dumping, surface compaction, soil cover, slope protection and leachate treatment at 3 sites while only 1 site at the beginning of the Project.	Project records, records of final disposal site	
	4-2 The design of New Final Disposal Landfill in East is revised in an environmentally friendly way for 11 improvements while 0 at the beginning of the Project.	Project records	

SWM: Solid Waste Management
ISWM: Integerated Solid Waste Management

PDM4 June 21, 2012

Activities	INPUTS		Pre-Conditions
	The Japanese Side	The Cuban Side	
1-1 To conduct the capacity assessment of DPSC in line with the M/P 1-2 To make the action plan in order to strengthen the management capacity of DPSC such as to plan, monitor and evaluate the detailed content of the project including coordination of the related organizations 1-3 To provide the training/OJT for UPPH to strengthen necessary SWM capacity except for activities relating to Output 2, 3 and 4 based on capacity assessment 1-4 To prepare the program of solid waste education both for sanitary workers and for the public including local residents, schools etc. 1-5 To implement the program based on Activity 1-4 by introducing on-site composting in school and other measures 1-6 To review and revise the M/P	1 Dispatch of Japanese Experts (Chief Advisor/ISWM, Segregated collection of waste/Composting, Machinery at Maintenance Workshop, Final disposal landfill, Vehicle maintenance) 2 Provision of the equipment (Organic waste carrier, materials for community composting facilitiy, containers for segregated organic waste, equipment for the maintenance workshop in UPPH and maintenance tools for the heavy machinery at final disposal site) 3 Training for Counterpart Personnel (in Japan, in a third country) 4 Local cost for the activity of Japanese Experts	1 Allocation of Counterpart Personnel 2 Office space for Japanese Experts 3 Local cost (Utilization of existing DPSC's machinery, maintenance/repairing cost for the existing machinery that is not covered by JICA support) 4 Composting yard in Calle 100 including electricity and water supply 5 Installation of the machinery including construction to supply electricity 6 Repair of the damaged weigh bridge in the final disposal site	
2-1 To consider the measures for waste reduction 2-2 To plan the Pilot Project for organic waste composting 2-3 To implement the Pilot Project activities on source-separated waste from large-scale generators such as hotels and restaurants in Pilot Project Site in collaboration with cooperative organizations such as the Soil Institute of the Ministry of Agriculture, DMSC, etc. 2-4 To implement the Pilot Project activities to produce compost in the compost yard in collaboration with cooperative organizations such as the Soil Institute of the Ministry of Agriculture, DMSC, etc. 2-5 To evaluate the Pilot Project activities			
3-1 To review the waste collection plan and to implement the revised plan 3-2 To equip the maintenance workshop in UPPH 3-3 To conduct the related activities to improve the operation of collection vehicles and containers 3-4 To provide the training for staff of UPPH			
4-1 To coordinate the vehicles' entrance to the existing final disposal sites 4-2 To conduct the related activities to improve the heavy machinery maintenance at the existing final disposal sites in collaboration with cooperative organizations such as CITMA Habana, Water Resource Institute, Sanitary Research Institute of the Ministry of Health, etc. 4-3 To provide advice on the design of New Final Disposal Landfill in East in collaboration with cooperative organizations such as CITMA Habana, Water Resource Institute, Sanitary Research Institute of the Ministry of Health, etc. 4-4 To prepare the training materials for operation and management of final disposal site including revision of existing operation guidelines and provide the training			

PDM4 June 21, 2012


Project Title: Improvement of the Capacity on Urban Solid Waste Management in Havana, the Republic of Cuba
Project Site: Habana Del Este Municipality
Pilot Project Site: Miramar Neighborhood in Playa Municipality
ANNEX 2
Plan of Operation (PO)
: Plan (Japanese)
: Plan (Cuba)
: Actual
project period : 61 months (approximately 5 years)
PO modified date: January 26, 2012
Plan of Operation
manpower assignment
materials input
1. Comprehensive management capacity on solid waste of DPSCs is improved.
1.1 Conduct DPSCs capacity assessment according to the Master Plan.
Chief/Deputy Advisor/Integrated SWM Expert
1.2 Formulate the Plan of Action to strengthen DPSCs management capacity to plan, monitor, and evaluate the project.
Group 1
Chief Advisor/Integrated SWM Expert
Deputy Advisor/Integrated SWM Expert
1.3 Provide on the job training to strengthen UPHPs capacity for MSW management.
Group 1
Deputy Advisor/Integrated SWM Expert
Training materials
1.4 Prepare the environmental education program on MSW for sanitary workers, local residents, schools, etc.
Group 1, 2, 3, 4
Deputy Advisor/Integrated SWM Expert
Training materials
1.5 Implement the program based on Activity 1-4 by introducing composting in schools and other measures.
Group 1
Deputy Advisor/Integrated SWM Expert
Segregated Waste Collection/Compost Expert
Training materials
1.6 Review and modification of the Master Plan.
Group 1, 2
Chief Advisor/Integrated SWM Expert
Deputy Advisor/Integrated SWM Expert
2. Solid waste source separation at Pilot Project Site is expanded and capacity of UPHPs in organic waste reduction at the source is strengthened.
2.1 Take into account the implementation of measures for organic waste reduction.
Group 1
Segregated Waste Collection/Compost Expert
Container and carrier for compost material
2.2 Plan the Pilot Project for organic waste composting.
Group 2
2.3 Implement activities related to the Pilot Project for segregated collection from large-scale generation.
Segregated Waste Collection/Compost Expert
Group 2
Container and carrier for recycle material
2.4 Implement activities related to the Pilot Project for compost production at the composting yard.
Segregated Waste Collection/Compost Expert
Group 2
Facility, electricity & water for composting compost
2.5 Evaluate activities related to the Pilot Project.
Segregated Waste Collection/Compost Expert
Group 2
3. Capacity of UPPH in the collection and transportation of solid waste is strengthened.
3.1 Review the Waste Collection Plan and implement the revised Plan.
Chief Advisor/Integrated SWM Expert
Group 3
3.2 Provide equipment and tools to the collection vehicle maintenance workshop in UPPH.
Vehicle Maintenance Expert/Machinery Expert
Equipment & tools for vehicle maintenance & spare parts, lubricant & tools, spare parts
3.3 Implement relevant activities to improve the operation of collection vehicles and containers.
Group 3
Chief Advisor/Integrated SWM Expert
3.4 Train UPPHs staff.
Group 3
Vehicle Maintenance Expert/Machinery Expert
Training materials
4. Capacity of UPPH and DPSCs on landfill operation and operation of final disposal site is strengthened.
4.1 Coordinate vehicle entrance to existing final disposal sites
Group 3
Final Disposal Site Expert
4.2 Implement relevant activities to improve heavy equipment maintenance.
Group 4
Material for truck scale
Final Disposal Landfill Expert
Machinery Expert
Maintenance tools
Provide expert advice on design and construction of the new East landfill site.
Group 3, 4
Spare parts
Chief Advisor/Integrated SWM Expert
Final Disposal Landfill Expert
4.4 Prepare training materials for the operation and management of the final disposal site, and provide the training
Group 4
Final Disposal Site Expert
Training materials
Joint Coordination Committee
Reports
Seminar
Group 4
PR: Progress Report
DFR: Draft Final Report
FR: Final Report
ICR : Inception Report

Annex:3 Evaluation Grid for Terminal evaluation

Project for Improvement of Capacity on Solid Waste Management in Havana city, the Republic of Cuba

Verification of Achievement Level

Items of Evaluation		Evaluation Question	Necessary Data	Source	Acquisition Means
Input provided	Japanese side 1. Dispatch of Japanese Experts 2. Equipment 3. Training in Japan 4. Financial support for local cost	Are the quantity, quality and timing of input as planned?	Quantity, quality and timing of input	Project reports Result of questionnaire survey and interviews with Japanese experts and the project manager of Cuban side	Document survey Interview Questionnaire survey
	Cuban side 1. Counterpart (C/P) 2. Facilities and utilities provided 3. Financial support				
Achievement level of Outputs	Output 1: Comprehensive management capacity on solid waste of DPSC is improved.	Is VI[1] 1-1 "Master Plan is updated by the end of the Project with 2 component projects, namely "construction of the new landfill in east and innovation of the workshops for vehicles & heavy machineries" physically completed at the rate of completion of 100% and 100% respectively." likely to be achieved?	Update situation of M/P	Revised M/P, Project reports	Document survey Interview Questionnaire survey
		Is VI 1-2 "Management process is improved in 3 aspects." likely to be achieved?	Improvement of 3 aspects	DPSC reports, Project reports Result of questionnaire survey and interviews with Japanese experts and the project manager of Cuban side	
		Is VI 1-3 "Quality of DPSC management-related report on plan, monitoring, and evaluation is improved by establishing 2 kinds of management reports." likely to be achieved?	Establishment of 2 management reports		
		Is VI 1-4.1 "Core Group: approximately 520 people are trained. 1) 15 Directors in technical and economic management for supervision, integrated management and work safety.	Number of trainees for the trainings		

[1] VI: Verifiable Indicator

	2) 106 Heads of Communal Zones in integrated management (waste collection-transportation-final disposal) and work safety. 3) Approximately 400 technicians in integrated management (waste collection-transportation-final disposal) and work safety. " likely to be achieved?		Document survey Interview Questionnaire survey
	Is VI 1-4.2 "Manuals (Textbooks) are prepared (3 kinds)" likely to be achieved?	Developing situation for 3 manuals	
	Is VI 1-5.1 "Solid waste education is conducted for 6 elementary schools and 2 junior high schools of the Popular Council of Miramar through the "Red de Formación Ambiental" while there was no such activity at the beginning of the Project. " likely to be achieved?	Situation of environment education	
	Is VI 1-5.2 "Solid waste education for the employees of the hotels and agricultural markets in Havana City is conducted at 10 entities while there was no such activity at the beginning of the Project." likely to be achieved?	Situation of environment education	
Output 2: Solid waste source separation at Pilot Project Site is promoted and capacity of UPPH in organic waste reduction at the source is strengthened.	Is VI 2-1 "Organic waste for composting in Pilot Project Site is collected by 1500 kg per day." likely to be achieved?	Collection amount of organic waste in Pilot Project Site	
	Is VI 2-2 "Compost in Pilot Project Site is produced to 650 kg per day." likely to be achieved?	Amount of compost produced in Pilot Project Site	
	Is VI 2-3 "Percentage of foreign material in organic waste to compost plant is reduced by 50 % as compared to the percentage at the beginning of the project." likely to be achieved?	Percentage of foreign material in organic waste which was transported in compost yard	
	Is VI 2-4 "Behavior change of local institutions in Pilot Project Area on waste reduction and separated collection reaches 5 institutions while there was no such	Number of local institutions where a behavior change is seen in Pilot Project Site	

	institution at the beginning of the project." likely to be achieved?			
Output 3 : Capacity of UPPH in the collection and transportation of solid waste is strengthened.	Is VI 3-1 "Average downtime of working collection vehicles is recovered to the level of CDT (Coeficiente de Disponibilidad Técnica) at 63.2 %, to the level of TR (Time for Repair) at 8.38 hrs/month, and to the level of TE (Time for Waiting to be repaired) at 5.46 hrs/month. * External factors: Spare parts and materials necessary for repair and maintenance of collection vehicles are supplied. " likely to be achieved?	Average downtime, TR and TE for collection vehicles	Records at workshop, Project reports	Document survey Interview Questionnaire survey
	Is VI 3-2 "Frequency of waste collection and transportation by UPPH is optimized with the index of VF (rate of Functioning Vehicle to Number of collection route) at 90% and NC (rate of Necessity of Container to planned number of container) at 15%. * External factors: It is possible to obtain reliable weighbridge data. " likely to be achieved?	Index of VF and NC for frequency of waste collection and transportation by UPPH	UPPH reports, Project reports Result of questionnaire survey and interviews with Japanese experts and the project manager of Cuban side	
	Is VI 3-3.1 "At the 7 main areas of the maintenance workshop (chasis, welding, machine tool room, tire repair shop, electricity, hydraulics, and injection lab), 20 mechanics are trained to correctly operate the equipment donated by the Project. " likely to be achieved?	Training records for mechanics		
	Is VI 3-3.2 "Seven (7) maintenance manuals are prepared for the main areas mentioned in 3-3.1. " likely to be achieved?	Situation of development of manuals for 7 maintenance techniques		
Output 4: Capacity of UPPH and DPSC on landfill design and operation of final disposal sites is strengthened.	Is VI 4-1 "The existing final disposal sites are properly operated and managed in dumping, surface compaction, soil cover, slope protection and leachate treatment at 3 sites while only 1 site at the beginning of the Project. " likely to be achieved?	Management situation in 3 existing final disposal sites	Project reports, final landfill site reports Result of questionnaire survey and interviews with Japanese experts and the project manager of Cuban side	
	Is VI 4-2 "The design of New Final Disposal	Improvement situation of design of		

		Landfill in East is revised in an environmentally friendly way for 11 improvements while 0 at the beginning of the Project. " likely to be achieved?	New Final Disposal Landfill		
Achievement level of Project Purpose	Capacity of DPSC on urban solid waste management in Havana City is strengthened through collaboration among cooperative organizations.	Is "5 improved activities on urban solid waste management are undertaken and being established during the final 12 months of the Project. Namely; (i) The training program is formulated and begins to be implemented for DPSC/UPPH's members based on the experience with the trained Core Group regarding Output-1;" likely to be achieved?	Situation of preparation and implementation of training program for DPSC/UPPH	Project reports Result of questionnaire survey and interviews with Japanese experts and project manager of Cuban side	Document survey Interview Questionnaire survey
		Is "(ii) Organic waste reduction achieved in the pilot project (to be about 1.5 ton/day) to be maintained regarding Output-2; " likely to be achieved?	Situation of organic waste reduction (to be about 1.5 ton/day)		
		Is "(iii) Vehicle repair and maintenance system upgraded (about 10% reduction of time required for several representative repair/maintenance works in the Workshop) by trained mechanics using equipment donated by the project to be maintained" likely to be achieved?	Time required for several main repair/maintenance works by trained mechanics		
		Is "(iv) Improvement of collection and transportation by means of the upgraded CDT and frequency optimization (productivity per liter of oil is expected to reach 0.90m3/L as compared to the 2008-09 level of 0.80m3/L) to be maintained regarding Output-3" likely to be achieved?	Change of fuel efficiency		
		Is "(v) Environmentally friendly landfill design advised by JET is incorporated into the new East Landfill to be constructed regarding Output-4." likely to be achieved?	Level of introduction of environmentally friendly landfill design in designing of new East Landfill		
Achievement level of Overall Goal	Urban solid waste management is properly implemented in Havana	Is VI 1 "Volume of primary materials recovered from waste in Havana City reaches 6,400 t/y from the current level of	Statistics for volume of recyclable waste	Project reports Result of questionnaire survey and interviews	Document survey Interview Questionnaire survey

	City and sanitary environment of the City is improved.	4,000 t/y." likely to be achieved?		with Japanese experts and the project manager of Cuba side	
		Is VI 2"Over 2 entities in Havana City consider to introduce waste reduction model practiced in Pilot Project while there was no entity at the beginning of the Project." likely to be achieved?	Number of final disposal site which introduce waste reduction model		
		Is VI 3"Number of environmentally friendly final disposal landfill sites which are properly maintained is more than 2 at the end of the Project while there was only 1 at the beginning of the Project." likely to be achieved?	Number of final disposal landfill sites which is employed environmentally friendly techniques		
		Is VI 4"The level of satisfaction among Havana's citizens in terms of the integrated solid waste management increases. As a representative indicator, the reduction in the number of complaints is used. The number of complaints decreased from 60/year/municipality to 36/year/municipality." likely to be achieved?	Number of complaints from residents		
Precondition		N/A			

Verification of Implementation Process

Items of Evaluation	Evaluation Question	Necessary Data	Source	Acquisition Means
Progress of inputs and activities	Have the Project inputs/activities been carried out according to the plan agreed on between Cuba and Japan sides?	Result of Input and activities	Project reports Result of questionnaire survey and interviews with Japanese experts, the project manager of Cuba side and C/P	Document survey Interview Questionnaire survey
Method of technical transfer	Has the technical transfer properly been made to C/P?	Result of activities Opinion from stakeholders	Project reports Result of questionnaire survey and interviews with Japanese experts, the project manager of Cuba side and C/P	Document survey Interview Questionnaire survey

Relation between stakeholders	Have regular meetings between the Cuba C/Ps and Japanese Experts sufficiently contributed to solving problems that occurred in the implementation process?	Opinion from stakeholders	Result of questionnaire survey and interviews with Japanese experts, the project manager of Cuba side and C/P	Document survey Interview Questionnaire survey
	Have the Cuban C/Ps and Japanese Experts adequately communicated with each other to share information regarding the project management and activities?			
	Are proper system of command chain and clear demarcated structure established for the project management?			
	Have the Project team and JICA (HQ and local office) sufficiently communicated with each other to share information regarding project management and activities?			
Ownership of the Project	Have the Cuba staffs (supervisors and C/Ps) adequately participated in project management and activities?	Result of activities Opinion from stakeholders	Project reports Result of questionnaire survey and interviews with Japanese experts, the project manager of Cuba side and C/P	Document survey Interview Questionnaire survey
	Has the Cuba Government allocated sufficient budget for the Project activities?	Financial condition Opinion from stakeholders	Project reports Related documents Result of questionnaire survey and interviews with Japanese experts, the project manager of Cuba side and C/P	Document survey Interview Questionnaire survey
	Does the Cuba Government understand the contents of the Project well?	Level of understanding on the contents of the Project by stakeholders	Result of questionnaire survey and interviews with Japanese experts, the project manager of Cuba side and C/P	Interview
Collaboration with Other Projects	Has the Project adequately collaborated with other projects implemented either by JICA or other donors?	Contents of collaboration with other donors Opinion from stakeholders	Project reports Result of questionnaire survey and interviews with Japanese experts, the project manager of	Document survey Interview Questionnaire survey

				Cuba side and C/P	
Factors affecting the Implementation Process	Have restructuring of implementing organizations or reshuffling of the supervisors and C/Ps affected the implementation of the Project?	Opinion from stakeholders	Project reports Result of questionnaire survey and interviews with Japanese experts, the project manager of Cuba side and C/P	Document survey Interview Questionnaire survey	
	Are there unpredictable factors which have adversely affected the Project implementation process?				

Evaluation based on Five Evaluation Criteria

Items of Evaluation		Evaluation Question	Necessary Data	Source	Acquisition Means
Relevance	Necessity	Is the Project Purpose and the needs of Cuba side (target group) corresponded?	Development plan Related documents Opinion from stakeholders	Project reports Related documents Result of questionnaire survey and interviews with Japanese experts and the project manager of Cuba side	Document survey Interview Questionnaire survey
		Is the Project Purpose corresponded with the needs of target area and social situation?	Sector development plan Opinion from stakeholders		
	Priority	Are the Overall Goal and the Project Purpose consistent with the National Development Plan, Sector development plan, other relevant policies?	Documents concerning the policy of the sector Opinion from stakeholders		
		Is the project objective consistent with Japan's aid policy and country cooperation plan of JICA?	Aid policy of Japan	Japan's aid policy	Document survey
	Suitability as a Means	Is the Project's approach was appropriate.	Result of project activities	Result of questionnaire survey and interviews with Japanese experts	Interview Questionnaire survey
		What kind of synergy has been with other donors?	Result of project implemented by other donors Opinion from stakeholders		
		Does the effect of the project spread other than target groups now or is there possibility to spread in the future?	Project report		
		Is the benefit of the effect or the burden of the cost distributed fairly?	Project report Opinion from stakeholders		
		Is the experience of technical cooperation projects of JICA utilized?	Experience of similar project Opinion from stakeholders		
		Is the experience of Japan utilized?	Advantage of Japan's experience Opinion from stakeholders		
	Others	Is there any change on the environment (policy, economy and society) surrounding	Opinion from stakeholders		

		the project？			
Effectiveness	Achievement level of Project Purpose(Forecast)	Is the Project Purpose likely to be achieved?	Project reports Opinion from stakeholders	Project reports Related documents Result of questionnaire survey and interviews with Japanese experts	Document survey Interview Questionnaire survey
		Is the setting up of indicators of Project Purpose appropriate?			
	Causal Relations	Are outputs of the project contributed to achieve the project objective? (Achievement of project cutputs has been caused by the Outputs.)	Project reports Opinion from stakeholders		
		Is there other necessary matter to achieve the objective of the project?	Project reports Opinion from stakeholders		
		【Important assumption】N/A			
		Is there other important assumption?			
		What are the inhibiting or contributing factors to achieve the Project Purpose?			
Efficiency	Achievement of output	Is the Output likely to be achieved as planned by adequate activities? If not, what is the inhibiting factor?	Achievement level and time of the Output Opinion from stakeholders	Project reports Result of questionnaire survey and interviews with Japanese experts, the project manager of Cuba side and C/P	Document survey Interview Questionnaire survey
		It the indicators for each Output level appropriate?	Achievement level Causal relation with Project Purpose		
	Appropriateness of Inputs	Was the dispatch of Japanese experts appropriate in terms of number, expertise, length and timing of their assignment?	Result of dispatch of Japanese experts Opinion from stakeholders		
		Was the provision of equipment from Japanese side appropriate in terms of types, quantity and timing of procurement?	List of procured equipment Opinion from stakeholders		
		Has the training of C/Ps in Japan or third country appropriately undertaken in terms of number of trainees, contents (relevancy to the project activities), length and timing?	Result of Trainings Opinion from stakeholders		
		Has the local cost support by the Japanese side been appropriate in terms of amount, use, and timing of disbursement?	Situation of C/P assignment Opinion from stakeholders		
		Has the assignment of C/P staff been appropriate in terms of number, position and competency?	Result of local cost Opinion from stakeholders		
		Have the local cost supported by the Cuba side been appropriate in terms of amount, use, and timing of disbursement?	Result of local cost Opinion from stakeholders		

	Cost	Comparing to the similar projects (cooperation conducted by the JICA project and other donors), the Output and the Project Purpose are commensurate with the input costs?		Project budget Budget of similar project Opinion from stakeholders	Project reports Related documents Result of questionnaire survey and interviews with Japanese experts	Document survey Interview Questionnaire survey
		Were the local resources utilized effectively?	Were the existing organizations or facilities utilized effectively?	Project reports Opinion from stakeholders	Project reports Related documents Result of questionnaire survey and interviews with Japanese experts	Document survey Interview Questionnaire survey
			Were the results of previous similar projects utilized effectively?			
	Factors which affect the effectiveness of implementing process of the Project	Were there any causes which obstruct the effectiveness of the project				
Impact	The Prospect of the Overall Goal Achievement	Is the Overall Goal expected to be achieved?		Opinion from stakeholders	Project reports Related documents Result of questionnaire survey and interviews with Japanese experts and the project manager of Cuba side	Document survey Interview Questionnaire survey
		Is the achievement of the Overall Goal expected to influence the development policy of the sector?				
		【Important assumption】N/A		Opinion from stakeholders		
		Is there other factor to inhibit the achievement of the Overall Goal?		Existence of inhibiting factors		
	Causal relationship	Isn't there significant gap between the Overall Goal and the Project purpose? Does the achievement of the Project purpose contribute the achievement of the Overall Goal?				
	Ripple effect	Is there other positive or negative effect except the Overall Goal?		Opinion from stakeholders		
Sustainability (prospect)	Policy, Institutional Aspect Organizational Aspect	Is the possibility to continue the political assistance high after the termination of the cooperation?		Policy and Strategy	Project reports Related documents Result of questionnaire survey and interviews with Japanese experts, the project manager of Cuba side and C/P	Document survey Interview Questionnaire survey
		Do the activities of pilot sites include a system to disseminate after the completion of the Project?		Plan		
	Organizational Aspect	Are DPSC and UPPH likely to maintain and		Organizational structure		

		develop the organizational structure including appropriate staff assignment with which the Outputs achieved through the Project can be sustained after the technical cooperation terminates?	Opinion from stakeholders		
	Financial Aspect	Are DPSC and UPPH likely to secure an adequate budget with which the Outputs achieved through the Project can be sustained after the technical cooperation terminates?	Financial condition Opinion from stakeholders		
	Technical Aspect	Is the method of technical transfer used in the Project likely to be maintained by C/P?	Opinion from stakeholders		
		Is the maintenance of facilities and equipment made properly?	Opinion from stakeholders		
		Is the transferred technique suitable to disseminate to other areas?	Opinion from stakeholders		
		Is the mechanism to disseminate the transferred technique to other area included in the Project?	Opinion from stakeholders		
	Social, Cultural and Environmental Aspect	Is there any factor to inhibit the sustainability on Social, Cultural and Environmental aspects?	Opinion from stakeholders		

Annex 4-1: List of Cuban counterparts

1. Project Director

Name	Title	Period
Mr. Sergio Aguilera	Sub-director general, DPSC	September 2009 to December 2011
Mr. José Carlos Batista Roca	Director, DPSC	June 2012 to November 2013
Mr. Mario Herrera Justiz	Director, DPSC	December 2013 to present

2. Project Manager

Name	Title	Period
Ms. Odalys García Fonseca	Principal Specialist, Development and Collaboration, Vice Direction of Investment –Development and Collaboration, DPSC	September 2009 to present

3. Counterparts

Name	Title	Period
Group 1. Solid Waste Management:		
Mr. Alejandro Fernández	Vice-director of Hygiene, UPPH	September 2009 to April 2013
Ms. Jaynet García	Solid waste specialist, DPSC	September 2009 to present
Mr. Juan Herrera	Environment Specialist, CITMA-Havana	September 2009 to present
Ms. Elida Romero	Environmental Impact and Management Specialist, CITMA-Havana	September 2009 to present
Ms. Yesley Gonzalez		September 2009 to February 2010
Ms. Milena Chanquet		March 2010 to October 2010
Mr. Ernesto Dominguez		October 2010 to present
Ms. Marilyn Díaz		December 2010 to July 2011
Mr. Cesar De Las Pozas		July 2011 to December 2011
Ms. Mariana Hechavarría	Public Relation Collaborator, Diffusion chief, DPSC	November 2010 to present
Mr. Alfredo Rodriguez	Tecnico de Hygiene, UPPH	June 2013 to present
Mr. Alien Martín Menendez	Electric engineer, DPSC	June 2013 to present
Group 2. Waste Reduction and Compost		
Mr. Andres Ruiz Yanes		September 2009 to November 2010
Ms. Irma Mesa		September 2009 to November 2011
Ms. Ivette Reyes		September 2009 to November 2011
Ms. Marilyn Díaz		September 2009 to November 2010
Mr. Pedro V. Pérez		December 2010 to September 2011
Mr. Ricelo Álvarez		June 2011 to November 2011
Mr. Carlos Lara		October 2011 to October 2011
Mr. Juan Amores		November 2011 to November

		2011
Ms. Juleidys Bravo		November 2011 to January 2012
Mr. Cesar De Las Pozas	Mechanical Engineer, DPSC	November 2011 to present
Mr. Alberto Cepero		January 2012 to September 2012
Mr. David Santana	Technician, Biogas and compost unit, UPPH	June 2012 to present
Mr. Apolonio Cerrano Miranda	Biogas and compost plant manager	October 2012 to present
Group 3. Vehicle Maintenance and Workshop Management		
Mr. Raul Aguilar	Vice-director of Mechanization, UPPH	September 2009 to March 2013
Mr. Felix Arturo Abreu	Vice-director General, UPPH	September 2009 to present
Mr. Jorge Quintana	Administrador del Taller de Equipos Pesados, UPPH	September 2009 to present (June 2012)
Mr. Fernando González	Vice-director of Purchasing, UPPH	September 2009 to present
Mr. Cesar De Las Pozas	Mechanical engineer, DPSC (assisting in monitoring of preparatory works for equipment installation)	November 2010 to present
Mr. Diego Guevara	Central Workshop Chief	October 2012 to present
Ms. Nury Cárdenaz	Repair and Maintenance Specialist, UPPH	June 2012 to June 2013
Mr. Fernando Amyl	Vice-Director of Mechanization, UPPH	April 2014 to January 2014
Mr. Enrique García	Specialist of Repair and Maintenance, UPPH	May 2013 to present
Mr. Eduardo Jimenez	Specialist of Repair and Maintenance, UPPH	May 2013 to present
Group 4 Landfill Design and Operation		
Mr. Gianni Ponce		September 2009 to May 2011
Mr. Pedro V. Pérez		September 2009 to September 2011
Mr. Ernesto Domínguez	Solid waste specialist, DPSC	June 2011 to present
Mr. Lazaro Sotolongo	Proposed for Guanabacoa landfill site chief	June 2012 to present
Ms. Grettel Gutierrez	Engineer in Environmental Management, DPSC	June 2012 to October 2012
Mr. Alberto Figueras	Principal Specialist and Investment Chief, DPSC	November 2012 to January 2013
Ms. Harilyn Tamayo	Investment specialist, UPPH	November 2012 to present
Mr. Antonio Blanco	Final Disposal Unit Chief	November 2012 to February 2013
Mr. Alexis Vazquez	Chief of Landfill Unit, UPPH	April 2013 to August 2013
Mr. Hermes del Toro	Civil Engineer, Management, DPSC	June 2013 to present
Mr. Camilo Rodríguez*	Landfill site unit head, UPPH	September 2013 to present
Group 5 General Issues		
Mr. Alejandro Louro Bernal	Vice-Director of Economy, DPSC	November 2010 to June/ December 2012
Mr. Rolando Gómez Gallardo	Sub-director of UPPA	November 2010 to June 2012

Mr. Adalberto González Arce	Director, UPPH	June 2012 to December 2012
Mr. Osvaldo Navarro	Director UPPH	January 2013 to June 2013

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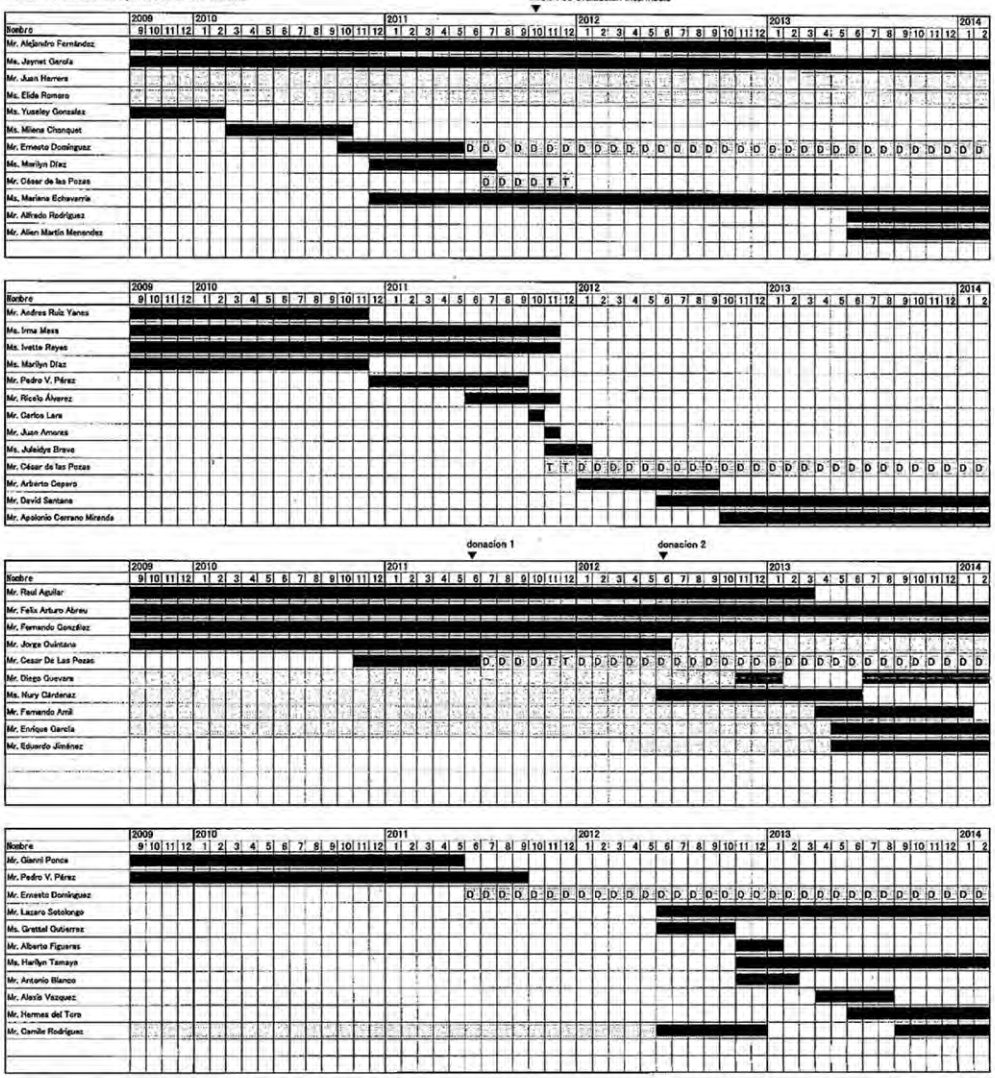
Anexo 4-2: Rotación de personas de C/P cubana

Mision de evaluacion intermedia



D,T Ernesto y Cesar: D=doble funciones de C/P, T=triple funciones de C/P.

Diego, Nury, Fernando Amil Enruque y Camilo: no estaba asignado como C/P, pero estaba en taller o en cargo.

Annex 5: List of Japanese experts

Name	Title	Period of Assignment
Mr. Kihachiro Urushibata	Chief Adviser	14th September 2009 -2nd December 2009 14th February 2010 – 15th March 2010 16th October 2010 – 20th December 2010 20th January 2011 – 15th March 2011 18th June 2011 – 25th July 2011 2nd October 2011 – 12th November 2011 21st January 2012 - 12th February 2012 2nd June 2012 – 1st July 2012 25th October 2012 – 17th November 2012
Mr. Tadaya Yamamoto	Deputy Chief Adviser	15th September 2009 – 26th September 2009 14th February 2010 – 30th March 2010 6th May 2010 – 20th June 2010 18th November 2010 – 12th December 2010 14th September 2011 – 13th November 2011 5th November 2012 – 3rd December 2012
	Chief Adviser	15th January 2013 – 13th February 2013 7th November 2013 – 10th December 2013 20th February 2013 – 22nd March 2014
	Expert team coordinators	4th December 2012 – 16th December 2012
	Project Coordinator(s)	6th February 2011 – 17th February 2011 19th June 2011 – 7th July 2011 4th December 2011 – 19th December 2011 29th January 2012 – 19th February 2012 19th May 2012 – 3rd June 2012 29th May 2013 – 9th July 2013
Dr. Ryoichi Ogawa	Composting / Segregated Collection of Waste (2)	14th September 2009 -12th December 2009 14th February 2010 – 15th March 2010 30th January 2011 – 15th March 2011 3rd October 2011 – 1st December 2011 21st January 2012 – 19th February 2012 9th May 2012 – 7th June 2012 1st October 2012 – 14th November 2012

		1st March 2013 – 20th March 2013 7th June 2013 – 1st July 2013 31st August 2013 – 22nd September 2013 12th February 2014 – 5th March 2014
Mr. Ryo Hiraga	Vehicle Maintenance (1)	24th October 2009 – 22nd November 2009 3rd November 2010 – 7th November 2010 26th November 2011 – 19th December 2011 3th June 2012 – 12th July 2012 10th November 2012 – 9th December 2012 25th April 2013 – 24th May 2013 21st November 2013 – 20th December 2013
	Machinery (1)	23rd November 2009 – 2nd December 2009 8th November 2010 – 9th December 2010 18th June 2011 – 1st August 2011 14th September 2011 – 13th October 2011 14th January 2012 – 12th February 2012
Mr. Tadayuki Yamanaka	Vehicle Maintenance (2)	24th October 2009 – 22nd November 2009 10th November 2010 – 9th December 2010 14th September 2011 – 13th October 2011 26th November 2011 – 19th December 2011 14th January 2012 – 12th February 2012 3th June 2012 – 12th July 2012 10th November 2012 – 9th December 2012 25th April 2013 – 24th May 2013 21st November 2013 – 20th December 2013
Mr. Takeshi Dosho	Machinery (2)	24th October 2009 – 26th November 2009 10th November 2010 – 9th December 2010 4th July 2011 – 2nd August 2011 13th January 2012 – 12th February 2012 3th June 2012 – 12th July 2012
Mr. Toshihiko Chiba	Final Disposal Landfill	14th February 2010 – 15th March 2010 2nd May 2010 – 20th June 2010 9th September 2010 – 7th December 2010 14th May 2011 – 22nd June 2011 1st October 2011 – 30th October 2011 30th May 2012 – 28th June 2012

		6th April 2013 – 28th April 2013 19th October 2013 – 10th November 2013
Mr. Shinsuke Okamoto	Project Coordinator(s)	14th September -12th December 2009 22nd February 2010 – 9th March 2010 1st November 2010 – 3rd December 2010

Annex 6: List of equipment procured by Japanese side

1. Procured equipment

Item	Quantity	Price (yen)
Lathe	1	9,848,580
Milling welder	1	8,089,950
Arc welder	4	4,078,900
Drum pump for Grease	1	3,977,320
Truck	1	2,643,000
Forklift	1	2,542,000
Tire changer	1	2,400,000
Upright drilling machine	1	1,925,730
Air compressor	4	1,794,306
Garage Jack etc	8	1,638,100
Car Washer	2	1,296,000
Tire repair machine	1	1,197,355
Drum	240	1,080,000
Air impact wrench	9	759,140
Nozzle tester	1	728,600
Hydraulic press	1	713,020
Double-headed grinder	8	644,650
Hand grinder	1	564,900
Gas Welding and Cutting equipment	4	476,980
Fuel injection pump tester	1	9,300,300
Clamping machine	1	2,764,400
Tire changer	1	2,525,400
Tire changer	1	2,525,400
Band saw	1	1,780,000
Air tank	1	1,008,000
Hydraulic press	1	791,600
Hand grinder	1	681,470
Tool set for P-type in-line fuel pump	1	602,500
Tool set for VA/VE type fuel pump	1	496,000
Garage jack	1	393,600
Bench vise	2	287,000
Double-headed grinder	1	279,800
Air impact wrench 25.4mm	2	276,400
Tire dolly	1	269,900
Air compressor	1	256,480
Oil pressure gauge set	1	231,000
Air drill	2	191,000
Air impact wrench 19mm	2	179,400
Torque wrench	1	118,500
Air impact wrench 12.7mm	2	110,800
Saw blade	4	94,400
Air sander	1	52,550
Chisel and punch set	1	9,100
Wire-brush	10	5,400

Screw pitch gauge metric standard type	1	5,200
Screw pitch gauge WW standard type	1	4,400
Other equipment (Mainly tools for vehicle maintenance)	1	13,351,719
Total		84,990,250

2. List of equipment brought from Japan

Item	Quantity	Price (yen)
TIG Welder Consumables	41	95,000
Gas Welder Consumables	20	26,600
Thickness gauge	1	3,800
Soldering Iron	2	1,600
Air Ratchet Wrench	2	9,000
Pressure Switch	1	6,900
V-Belt	3	3,600
Pressure Gauge with Indicator	2	2,200
Magnet Switch	1	10,200
Air Regulator	4	25,200
Motor Breaker	1	2,700
Punch Set	1	6,700
Multi Powered Gear Wrench	1	77,000
Torque Wrench	1	53,000
Punch Set	1	6,700
Air Impact Wrench	1	129,000
Inner Socket	3	8,850
Coupler	20	11,650
Conversion Coupler	20	23,500
Plug for Urethane Hose	10	2,400
Seal Tape	10	1,000
Pipe Joint Elbow	30	2,700
Pipe Joint Long Nipple	10	3,300
Inflate Tire Gauge	1	8,400
Air Impact Wrench	1	129,000
Air Regulator	4	25,200
Socket	12	51,300
Seal Tape	2	2,000
Pipe Joint Union	8	4,000
Gate Valve 125	6	6,000
Vibration Drive Drill	1	17,500
Drill Bite	9	3,240
Air Dust-blow Gun	3	8,250
Bent Nozzle for Air Dust-blow Gun	6	12,510
Air Drive Rivet Gun	1	170,000
Air Drive Belt Sander	1	38,500
Sander Belt	1	5,700
Sander Belt	7	31,950
Pipe Joint Elbow	10	1,300
Pipe Joint Nipple	10	900

Pipe Joint Socket	10	1,550
Pipe Joint T	6	1,260
Total		1,015,960

3. List of equipment brought from overseas

Item	Quantity	Price (US$)
Office equipment / consumables (from Mexico)		10,052.46
Anti-Virus (norton2010)	1	101.34
Anti-Virus (norton2011)	1	101.08
Toner (copy machine)	4	491.71
Prado Parts (from Japan)		198.87
Prado Parts (from Dominican Republic)		9,580.80
Shipping from DR (1)	1	834.90
Shipping from DR (2)	1	661.00
Total		22,022.16

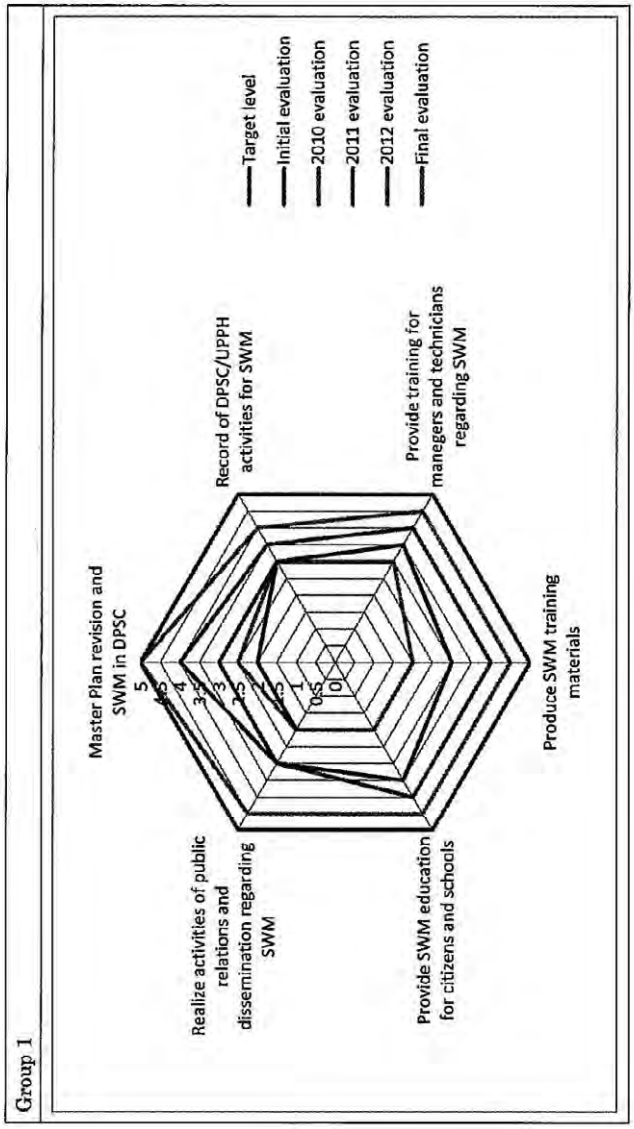
Annex 7: Training in third country

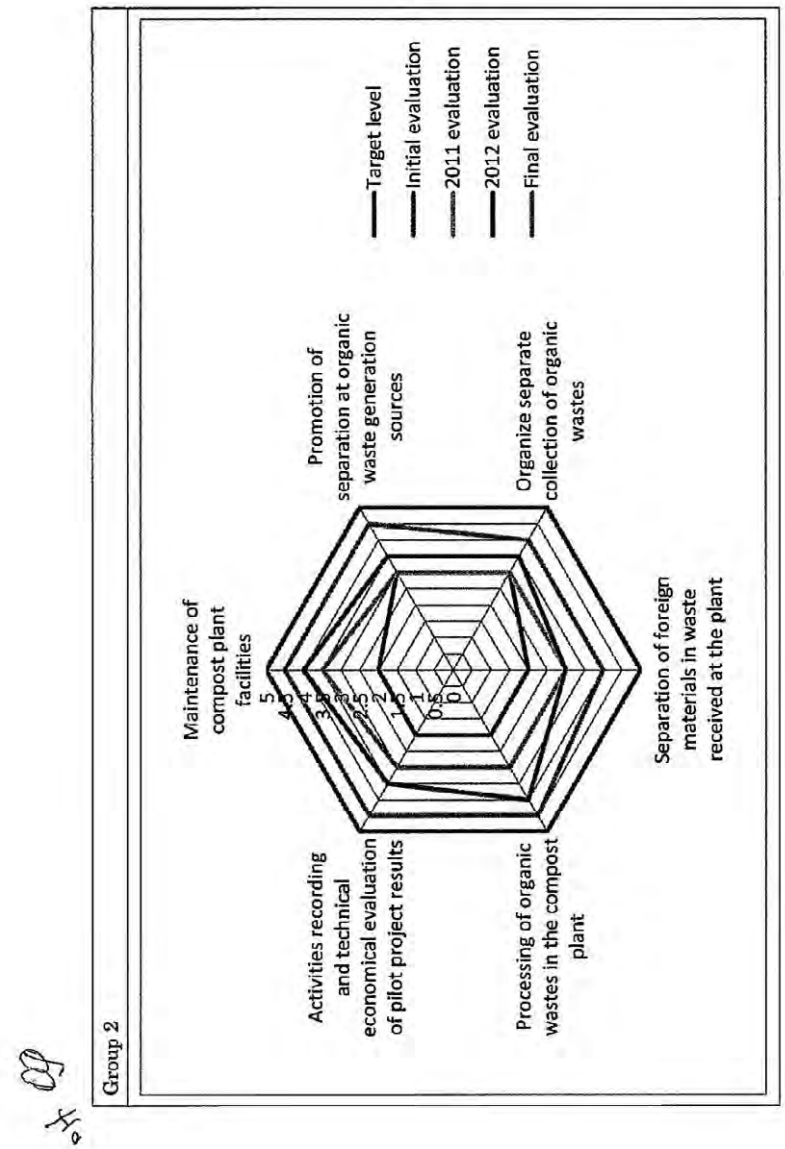
	Name	Organizations		Terms	
				From	To
1	Adalberto Gonzalez Arce	Provincial Director of Waste Collection and Final Disposal	UPPH	2012/12/3	2012/12/8
2	Odalys Gracia Fonseca	Assistant Director of Investments and Development	DPSC	2012/12/3	2012/12/8
3	Lazaro Sotolongo Esquivel	Manager of the new sanitary landfill site in Guanabacoa	DPSC	2012/12/3	2012/12/8
4	Basilio de Vallin Marcheco	Designer of the new Guanabacoa sanitary landfill site	DCH	2012/12/3	2012/12/8
5	Jose Francisco Santiago	Designer of the leachate treatment at the new Guanabacoa sanitary landfill site	INRH	2012/12/3	2012/12/8
6	Alejandro Fernandez Colomina	Assistant Director of Sanitation, UPPH	UPPH	2012/12/9	2012/12/15
7	Felix Arturo Abreu Lacalle	Assistant Director, Provincial Sanitation Unit	UPPH	2012/12/9	2012/12/15
8	Jaynet Garcia Portero	Waste Specialist, Division of Investments and Development, DPSC	DPSC	2012/12/9	2012/12/15
9	Fernando de Jesus Amil Leal	Mechanization Specialist, Division of Mechanization, UPPH	UPPH	2012/12/9	2012/12/15
10	Nury Cardenas Veliz	Specialist, Division of Mechanization	UPPH	2012/12/9	2012/12/15

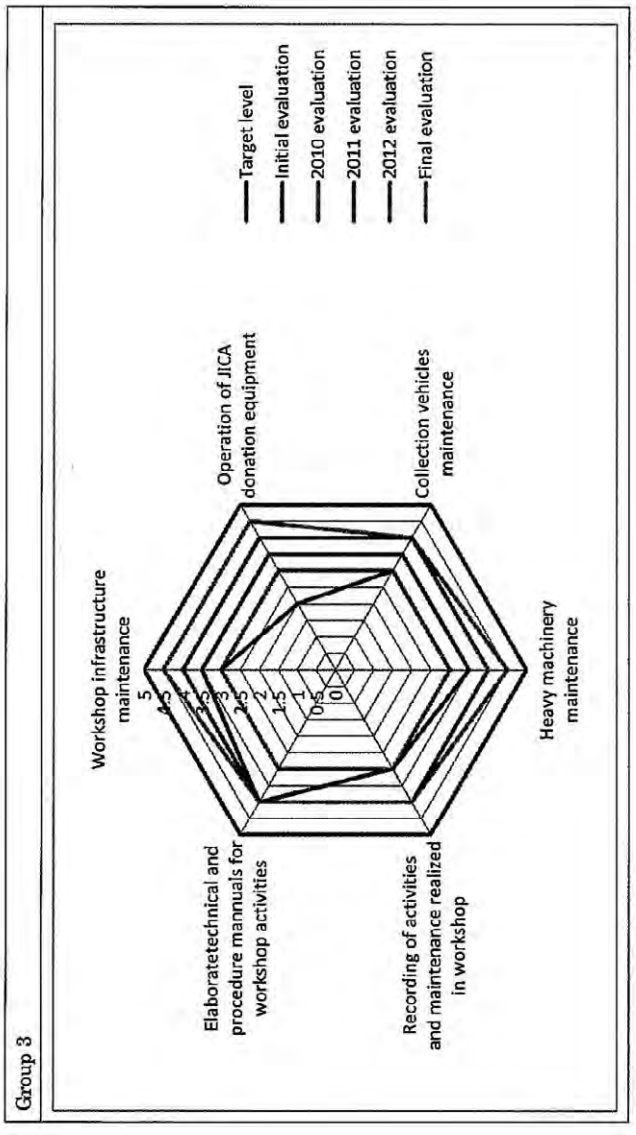
Annex 8: List of seminars and workshops

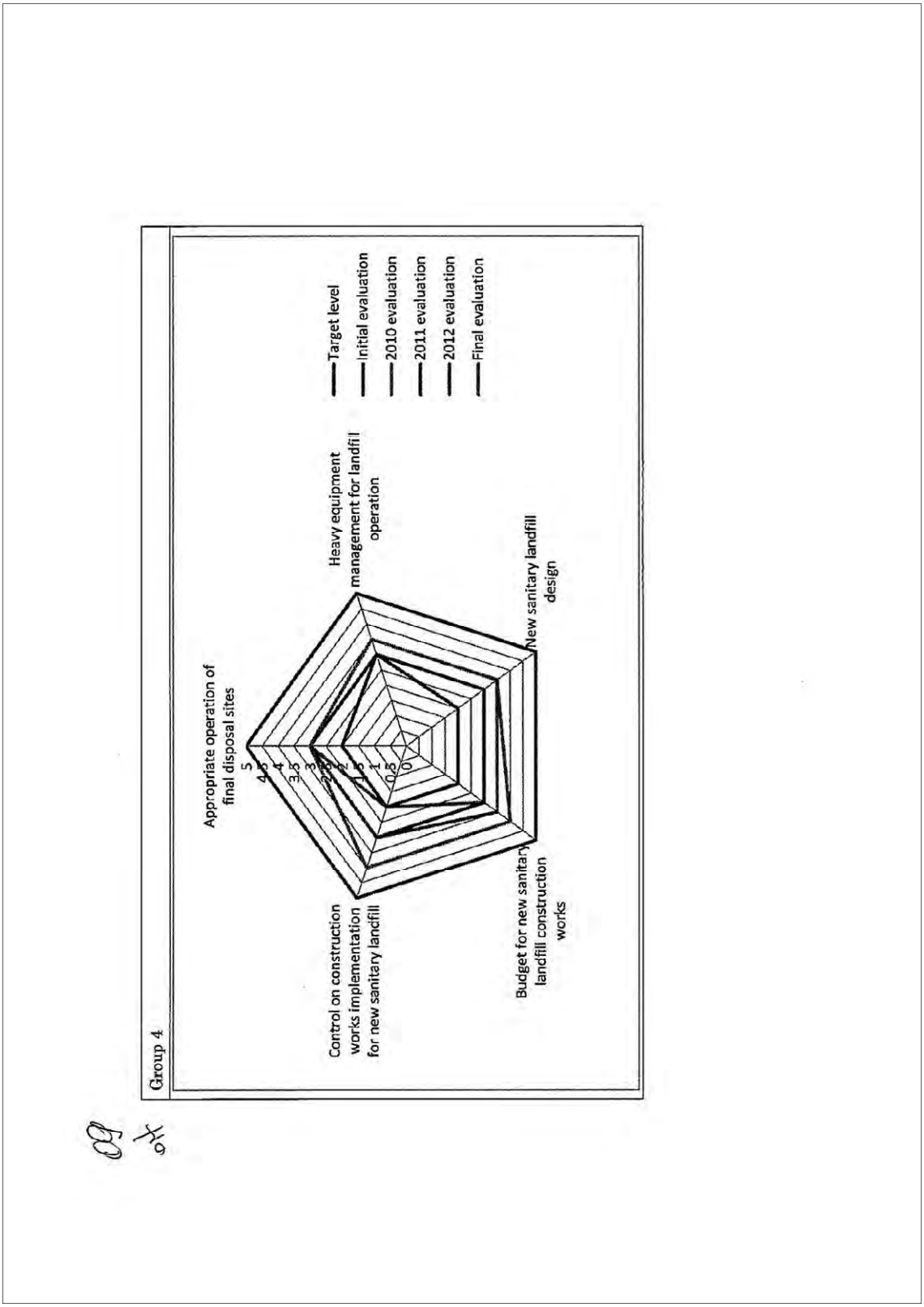
Title	Date	Contents
Annual Seminar of the Project (1st)	5th November 2009	Project presentation
Annual Seminar of the Project (2nd)	30th November 2010	Project progress
Workshop for Planning of Compost Pilot Project	22nd February 2011	Planning aspects of composting
Training Seminar for Municipal Directors of Communal Services	26th February 2011	Solid waste management practices
Training Seminar for Integral Hygiene	3rd March 2011	Solid waste management practices
Environmental Education Workshop with Site Tour	5th November 2011	Educational activities
Workshop of Compost Manual	25th November 2011	Composting practices
Annual Seminar of the Project (3rd)	14th December 2011	Project progress
Seminar and Site Tour on Solid Waste Management	9th February 2012	Information sharing for collaborating parties
Seminar on Integral Solid Waste Management	29th May 2012	Aspects on Integrality in solid waste management
Expansion of Compost Pilot Project	31st May 2012	Merits and demerits of pilot project expansion
Annual Seminar of the Project (4th)	15th November 2012	Project progress
Seminar on Mexico Training Course	6th February 2013	Experiences from Mexico Training Courses
Principles of Waste Management	27th June 2013	Basic principles of solid waste management
Workshop on Problems Solution for Compost Project	12th September 2013	Analysis on problems of the pilot project
Design how to dispose waste	18th September 2013	Environmental education
Annual Seminar of the Project (5th)	28th November 2013	Project progress

Annex 9: Result of capacity assessment for each output group




Group 2
Promotion of separation at organic waste generation sources
Organize separate collection of organic wastes
Separation of foreign materials in waste received at the plant
Processing of organic wastes in the compost plant
Activities recording and technical economical evaluation of pilot project results
Maintenance of compost plant facilities
Target level
Initial evaluation
2011 evaluation
2012 evaluation
Final evaluation


Group 3
Target level
Initial evaluation
2010 evaluation
2011 evaluation
2012 evaluation
Final evaluation
Operation of JICA donation equipment
Collection vehicles maintenance
Heavy machinery maintenance
Recording of activities and maintenance realized in workshop
Elaboratetechnical and procedure mannuals for workshop activities
Workshop infrastructure maintenance
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5


Group 4
Appropriate operation of final disposal sites
Heavy equipment management for landfill operation
New sanitary landfill design
Budget for new sanitary landfill construction works
Control on construction works implementation for new sanitary landfill
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Target level
Initial evaluation
2010 evaluation
2011 evaluation
2012 evaluation
Final evaluation

Annex 10: Final Evaluation of the Sustainability of the Activities Related to the Project for Improvement of Capacity on Solid Waste Management (February, 2014)

The evaluation of the sustainability of the activities implemented during the Project for Improvement of Capacity on Solid Waste Management in Havana City, Republic of Cuba, is conducted using the "strength, weakness, and opportunity" criteria. It is based on the activities carried out to achieve the Project's expected outcomes as pointed out in Progress Report 1.

The Project's expected outcomes are included in the categories, whereas the activities carried out in order to achieve the expected outcomes are included under the sub-categories.

Category	Sub-category	Strength	Weakness	Opportunities	Risks	Remarks by DPSC
Group 1 Solid waste management	Master Plan Revision/updating	The C/P staff, with the advice of JICA' s Expert Team, revised the Master Plan formulated in 2006 by updating the available information on the present solid waste management and by planning prioritized activities for the short term (2015-2017) and the medium term (2018-2020).	Manager's participation in the revision/updating of the Master Plan was extremely limited. The activities for solid waste management in Havana City planned for the short and medium terms are accepted by DPSC and UPPH's managers. However, they need to better understand the financial and organizational implications of the activities proposed in the revision of the Master Plan. The changes in technical and managerial staff may provoke that when those involved in the Master Plan revision leave DPSC/UPPH, the newly appointed personnel may not know the updated Master Plan and so fail to put it into practice.	The updated Master Plan is instrumental in planning solid waste management in Havana City for the next years. The updated Master Plan examines the flaws of the present system for the management of solid wastes in Havana City and it proposes several alternative solutions. It also warns about the risks of the existing waste management system and proposes the activities to be carried out to prevent them.	The Master Plan has been updated. The main risk lies in the failure to disseminate it, that DPCS/UPPH's managers or the city's senior officials fail to understand it deeply and it ends up being another document in their files. In order to prevent such a risk, seminars are recommended to be held to discuss the updated Master Plan attended by the technical and managerial staff who was not actively involved in its formulation. This seminar should also be held for the technicians and managers who join DPSC/UPPH in the future.	In order to prevent the updated Master Plan from eventually turning out to be just another document, we suggest that it should be channeled to UPPH, DPSC, and CAP's top authorities for its approval so that it may become a guide for the activities related to the city's sanitation.
	Community education/participation	The results of the pilot project on proper solid waste management implemented in some districts showed that the residents are willing to cooperate with the projects executed to improve waste management, including those related to waste segregation at the source. Moreover, the projects carried	The lack of collection equipment makes it impossible for community participation-based projects for solid waste management to ensure its continuity because the collection of wastes or recyclable materials initially promised is not carried out on a regular basis. The pilot project focusing on environmental education for solid waste management at schools had to be implemented in an extra-	A proper assessment of the results of the pilot projects focusing on raising environmental education for solid waste management implemented at some schools, which proved that the students and residents are willing to get involved in waste management and 3R's-related activities, may favor the allocation of financial, material, and human resources, although limited, for these activities enabling to continue or	The greater risk is the failure to continue this activity for lack of resources or because it is not a priority for DPSC/UPPH's authorities.	Although environmental education is taught at schools in Cuba, the issues directly related to solid waste management should be dealt with more deeply. Therefore, both DPSC and UPPH's development plans should include the implementation of projects and initiatives fostering community work aimed at raising people's awareness in sanitation-related matters.

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Category	Sub-category	Strength	Weakness	Opportunities	Risks	Remarks by DPSC
		out in schools proved the students' willingness to learn about waste management and to cooperate with the activities related to the 3 R's.	curricular way as this subject is not included in the syllabus. No budget has been allocated for activities related to environmental education or dissemination at DPSC/UPPH.	replicate the pilot projects implemented during the Project for Improvement of Capacity on Solid Waste Management.		
Group 2 Waste reduction and composting	Pilot composting project and plant	During the pilot project for composting, a small plant was built and operated for the treatment of organic wastes segregated at the source and collected at hotels and agricultural markets. The technical and financial feasibility of the composting process for this kind of wastes was also proven. The product obtained at the compost plant has been successfully used in some of the city's green areas and it is expected to be sold at the same agricultural markets generating the wastes processed.	The first weakness is waste segregation at the source, as organic wastes were mixed with a lot of foreign materials, which had to be removed at the compost plant. The second weakness is the inadequate collection of organic wastes segregated at the source, which originates some resistance from the residents to cooperate as the segregated wastes are not timely collected, thus causing a great deal of inconvenience.	Facilities, equipment, and trained staff are available to process previously segregated organic wastes at the Pilot Composting Plant installed during the Project implementation. The technical and financial feasibility of organic waste processing, as well as the suitability of using the finished product to improve the soil at the city's green areas, was proven.	The first risk is that the waste generation sources stop segregating organic wastes because they are not timely collected or because they would rather use them for other purposes, e.g. for pig feeding. The second risk is the lack of the equipment and the vehicles required for the temporary storage of the segregated organic wastes and their timely collection. The third risk is that the arrangements necessary to authorize compost sale at the agricultural markets supplying the wastes are not made.	The implementation of this project and other projects before it has helped UPPH increase their expertise in terms of the production of quality compost. Therefore, UPPH is currently qualified to achieve more ambitious goals. Segregated waste collection at the generation source should be increased as there are enough large metal containers and 770ls containers installed to collect the organic wastes generated by the markets enabling to produce large amounts of quality compost.
Group 3 Vehicle maintenance and workshop management	Equipment donated by JICA	The equipment donated by JICA to the collection vehicle maintenance workshop has already been installed and are currently being operated, thus increasing dramatically the	The supply of spare parts for vehicle repair is deficient due to resource limitations, inadequate availability of parts in the local market, and prolonged procedures to be followed for parts acquisition. The stay of vehicles in the workshop is increased due to the lack of spare parts and consumable materials such	There are tools and equipment available for proper workshop operation, as well as trained staff to operate the equipment and perform the most frequent repair.	Staff changes may provoke that the newly-appointed people replacing those trained during the implementation of the Project for Improvement of Capacity to operate the equipment and to perform the most frequent repairs lack the qualification required to operate the donated equipment, which	The donation of equipment for the workshop is one of the greatest contributions of this project enabling to revitalize an ill-equipped facility. Staff training has been excellent with 20 manuals produced. Working conditions have improved dramatically at the workshop. At present parts and accessories can also be

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		workshop's repair capabilities, reducing repair time, and improving the vehicle availability rate. The repair workshop staff was trained to properly operate the tools and equipment donated by JICA, as well as to carry out the most frequent repair works.	as tires, which reduces vehicle availability for waste collection. The workshop lacks a department responsible for machinery and equipment maintenance, especially those donated by JICA.		may bring about breakdowns. The lack of a department responsible for equipment maintenance and the limited availability of spare parts at the local market, especially for the equipment donated by JICA manufactured in Japan, jeopardize not only the proper operation of the equipment, but also the continuity of the operations. This may originate that some minor breakdowns, which could be repaired at a low cost, may interrupt the operation of some expensive pieces of equipment necessary for the workshop activities.	manufactured, thus facilitating increasingly timely vehicle repair. This component should be further implemented in the future for the sake of the project's sustainability. To this effect, we have requested its continuity by way of the implementation of a new project. In addition, we believe it extremely necessary to set up a maintenance group at the workshop as soon as possible.
	Workshop management	Several technical and organizational manuals were prepared during the implementation of the Project for Improvement of Capacity. Records of preventive and corrective maintenance of collection vehicles were also formulated. Preventive maintenance of vehicles was likewise introduced, thus helping increase their service life and keep a record of the vehicle maintenance, which will help anticipate the most frequent breakdowns and ensure a stock of spare parts, thus	Although preventive maintenance of collection vehicles has already been established, it is difficult to comply with planned maintenance works due to lack of lubricants and consumable materials. Staff changes make it difficult to keep a record of the repair works performed for each collection vehicle. Computers are also lacking at the workshop, thus making it impossible to keep a digital record of workshop operations and vehicle repair.	The installation and operation of the tools and equipment donated by JICA entail some minor investments so that the workshop may properly operate and the operation of the equipment donated by Japan may be guaranteed.	Staff changes may provoke that the newly appointed personnel replacing those who were trained to manage the equipment and prepare the records lack the training required for proper workshop management, thus affecting the continuity of record keeping.	Workshop staff changes should not affect work continuity as working procedures will continue to be the same, both for old and new employees. We count on JICA to continue its support in this field.

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Category	Sub-category	Strength	Weakness	Opportunities	Risks	Remarks by DPSC
		facilitating repair works and reducing downtime of vehicles.				
Group 4 Sanitary landfill site design and operation	Sanitary landfill site design	The Project for Improvement of Capacity offered some advice to the C/P staff regarding the design of the new Guanabacoa sanitary landfill site and the executive project for the first stage, thus providing the necessary elements to begin the site construction. Training in Mexico City made it possible for the C/P staff to correct some mistakes in the design of the new Guanabacoa sanitary landfill site. Training received by the C/P staff related to the design of sanitary landfill sites made it possible to have some qualified personnel on the subject in Cuba and to have the capability for the design of other sanitary landfill sites, especially the planned new West site.	Existing financial limitations made it impossible to begin the construction of the new Guanabacoa sanitary landfill site four years ago as planned, practically at the beginning of the Project for Improvement of Capacity. These same limitations have delayed the commencement of the design works for the new West sanitary landfill site.	The design and the executive project for the first stage of the new Guanabacoa sanitary landfill site are ready. Therefore, the site construction may start any time. The microlocation survey for the new West sanitary landfill site. Therefore, the design and the executive project for the first stage may be undertaken.	The risk lies in the failure to execute the works corresponding to the design and the executive project already prepared, thus further delaying the beginning of the site construction, which may provoke that the sites currently being operated no longer can receive wastes and that some new makeshift sites, as was the case during the so called Special Period, may have to be used for waste disposal. Moreover, if earth moving works begin at the new Guanabacoa landfill site and are then interrupted, there is a chance of losing the investments made due to the exposure to the elements.	The formulation of the executive project for the new East Sanitary Landfill Site is considered to be a major achievement as this is the first site of its kind to be built in Cuba. Although delayed, the site construction will be eventually realized because the funding and the contractor are both currently available. Our intention to make the most of the final disposal expert's knowledge during the site construction and operation could not be materialized. Therefore, we will have to deal with it by ourselves in the future. We will certainly make the most of the transferred knowledge to design the new landfill sites.
	Sanitary landfill site operation	Some guidance on proper waste dumping, compaction, and covering at the sites currently being operated was	Recommendations about appropriate waste discharge, compaction, and covering at the landfill sites are not properly followed due to the limited number of heavy equipment and vehicles.	There are available manuals about proper discharge, compaction, and covering of the wastes at the landfill sites. Training conducted in Mexico City in 2013, as well as the	The greatest risk lies in the fact that the flaws in the operation of existing final disposal sites may provoke fires like the ones that broke out recently. These flaws may reduce the	Proper site operation is duly regulated in UPPH's manuals. The staff to operate the landfill sites will continue to be trained in the future either with JICA's assistance or by our own experts.

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Category	Sub-category	Strength	Weakness	Opportunities	Risks	Remarks by DPSC
		provided during the implementation of the Project for Improvement of Capacity. Therefore, the employees and managers trained are aware of the operations required for the proper management of final disposal sites. In addition, some equipment were donated for the Heavy Machinery Workshop in Calle 100 landfill site and the staff was trained to repair some heavy equipment then out of service, thus increasing their availability for landfill site operations.	Cover materials are also limited as the authorization to procure them directly from a quarry is yet to be obtained.	training activities planned for the year 2014, include visits to landfill sites to see their operations and receive the corresponding technical explanations, thus helping to qualify the personnel for the proper operation of existing final disposal sites and the sanitary landfill sites to be built in the future.	service life of the currently operated sites due to inadequate waste discharge and compaction. Another risk is the uncontrolled operation of scavengers at the sites, which may originate accidents, delayed operations, and even the spread of diseases.	

Appendix II

Participant List

Cuban Side	
Mr.Mario Herrera Justiz	Director, D.P.S.C.
Director del proyecto, Joint Evaluation Team	
Ms.Odalys García	Especialista Principal, D.P.S.C.
Gerente del Proyecto, Joint Evaluation Team	
Ms.Jaynet García	Especialista en Residuos Sólidos, D.P.S.C.
Grupo 1	
Ms.Mariana Hechavarria	Colaboradora para las Relaciones Publicas,
Grupo 1	Jefa de Divulgación, D.P.S.C.
Mr.César de Las Pozas	Especialista, D.P.S.C.
Grupo 2,3	
Mr.Diego Guevara	Jefe del Taller Central, U.P.P.H.
Grupo 3	
Mr.Ernesto Domínguez	Especialista en Residuos Sólidos, D.P.S.C.
Grupo 4	
Mr.Basilio del Vallin Marcheco	Proyectista, DCH
Grupo 4	
Ms.Ivón Martínez	Especialista en Dirección de Asia y Oceanía MINCEX
Joint Evaluation Team	
Ms.Mirna Laffita	Vicedirectora general de Economía y Planificación de CAP
Mr.Osmani Castro Cruz	Especialista en Colaboración, , Dirección Provincial de
Joint Evaluation Team	Relaciones Internacionales y Colaboración, La Havana
Mr.Pedro de la Torre	Especialista en Colaboración, , Dirección Provincial de
Joint Evaluation Team	Relaciones Internacionales y Colaboración, La Havana
Mr.Roberto Castellanos Pérez	Delegado del CITMA-Habana
Member of Joint Coordination Committee	
Mr.Juan Herrera	Especialista en medio ambiente, CITMA-Habana
Grupo 1, Joint Evaluation Team	
Japanese Side	
Dr.Mitsuo Yoshida	Líder Asesor de JICA Japón
Joint Evaluation Team	
Mr.Ken Okumura	Coordinador, dpto.de medio ambiente global, JICA
Joint Evaluation Team	Japón
Mr.Satoshi Nagashima	Asesor principal,, ICONS,Inc. Japón
Joint Evaluation Team	
Japanese Expert Team	
Mr.Tadaya Yamamoto	Asesor Jefe Experto del proyecto
Ms.Chie Masuda	Coordinadora del proyecto
Mr.Vicente García	Traductor
Ms.Roxana Fernández	Traducutora
JICA Cuba	
Mr.Tatsuo Suzuki	Coordinador de JICA Cuba