



THE REPUBLIC OF THE PHILIPPINES
MUNICIPALITY OF MALAY



NATIONAL SOLID WASTE MANAGEMENT
COMMISSION



JAPAN INTERNATIONAL COOPERATION
AGENCY

THE MASTER PLAN ON SOLID WASTE MANAGEMENT

FOR BORACAY ISLAND
AND MUNICIPALITY OF MALAY
FINAL REPORT

(VOLUME III – 1: SUPPORTING REPORT No.1 – Text)



March 2008

NIPPON KOEI CO., LTD.

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THE MASTER PLAN ON SOLID WASTE MANAGEMENT

FOR BORACAY ISLAND
AND MUNICIPALITY OF MALAY
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Volume II: Main Report

Volume III: Supporting Report

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VOLUME III: SUPPORTING REPORT

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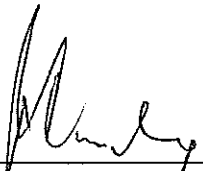
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**PART I: MINUTES OF MEETING OF
STEERING COMMITTEE**

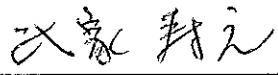
MINUTES OF MEETING
OF
1st STEERING COMMITTEE
FOR
THE MASTER PLAN ON SOLID WASTE MANAGEMENT
FOR BORACAY ISLAND AND MALAY MUNICIPALITY
IN
THE REPUBLIC OF THE PHILIPPINES

AGREED UPON AMONG
MUNICIPALITY OF MALAY,
NATIONAL SOLID WASTE MANAGEMENT COMMISSION,
AND
JICA STUDY TEAM

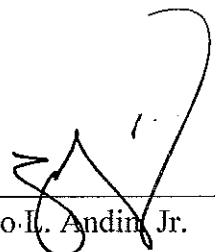
Boracay Island, 23rd March 2007



Hon. Ceciron S. Cawaling
Mayor
Municipality of Malay, Aklan
The Republic of the Philippines

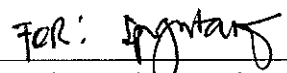


Mr Toshiyuki Ujiie
Team Leader
JICA Study Team



Atty. Zoilo L. Andin Jr.
Executive Director
National Solid Waste Management
Commission (NSWMC)-Secretariat
The Republic of the Philippines

Witness;



Mr. Bienvenido L. Lipayon
OIC, Regional Director
Environmental Management Bureau
Region VI

1. Introduction

The Japan International Cooperation Agency (hereinafter referred to as "JICA") has organized and dispatched the JICA Study Team (hereinafter referred to as "the Study Team") to the Philippines since March 20, 2007, according to the Implementing Arrangement among Municipality of Malay (hereinafter referred to as "MOM"), National Solid Waste Management Commission (hereinafter referred to as "NSWMC") and JICA signed on 14th February, 2007.

This Minutes of Meeting is a record of the 1st Steering Committee (hereinafter referred to as "ST/C") held on March 23, 2007 for discussion on Draft Inception Report (hereinafter referred to as "IC/R") for the Master Plan on Solid Waste Management for Boracay Island and Malay Municipality in the Philippines (hereinafter referred to as "the Study") and other issues related to the Study that have been agreed upon between the Philippines side and the Japanese side (hereinafter referred to as "Both sides"). The list of attendants to the meeting is attached in Appendix-1.

2. Submission and Explanation of Draft IC/R Report

The Study Team submitted twenty (20) copies of the draft IC/R to MOM, NSWMC and other organizations concerned on 23rd March, 2007, and explained the contents of the IC/R to them.

3. Contents of Draft Final Report

At this ST/C; Both sides discussed the contents of the draft IC/R and made further clarifications about the Study. The main issues on the discussions regarding the draft IC/R are as follows:

3.1 Study Schedule

Both sides confirmed the study schedule as follows:

- Phase 1: March 2007 – August 2007 (Master Plan Formulation)
- Phase 2: September 2007- January 2008 (Feasibility Study of Priority Project(s))

As new landfill site is needed to be constructed urgently, it was explained by the Study Team that the feasibility study such as engineering design and cost estimate for the new landfill site would be conducted in Phase 1.

As for Phase 3, it was also confirmed by Both sides that the final decision, whether to conduct Phase 3 as a monitoring/follow-up, would be made at the final stage of the Study as per agreed on Minute of Meeting signed on 29th November, 2006.

3.2 Target Solid Waste to be Covered by the Study

for
W

for: JICA

for: MOM

Both sides confirmed that the target waste to be covered by the Study is municipal solid waste including health care waste. However, MOM raised their concern on the need to find better management methods for sludge disposal in Boracay Island. As the results of discussion, the Study Team agreed to examine possible treatment of the sludge, such as composting together with biodegradable waste, as part of the Study.

3.3 Target Year

As the Master Plan is the 10 years' plan, Both sides confirmed that the Master Plan (hereinafter referred to as "M/P") would be formulated for a period from 2008 to 2017.

3.4 Implementing Organization of the Study

Both sides confirmed that the implementing organizations of the Study were MOM and NSWMC. The Philippine counterpart personnel of the Study were also confirmed as per attached in Appendix 2.

As for ST/C, Both sides also confirmed members of ST/C which would be chaired by Mayor of MOM as follows:

- Executive Director of NSWMC
- Committee chair on Environment and Natural Resources, Sangguniang Panlalawigan, Province of Aklan,
- Committee chair on the Environment and Natural Resources, Sangguniang Bayan (SB), Municipality of Malay
- Regional Director, DENR/EMB, Region VI
- Provincial Environmental Natural Resources Officer (PENRO), DENR, Kalibo, Aklan
- Philippine Tourism Authority (PTA), Boracay
- Boracay Eminent Persons Group Secretary, Office of the President
- Boracay Foundation, and Boracay Chamber of Commerce and Industry
- Representative, JICA Philippines Office
- * Other agencies or organizations deemed necessary.

The Study Team explained that the team would employ local consultants and/or NGOs to conduct the following surveys. The local consultants and/or NGOs will be selected based on the guideline of local consultant selection of JICA.

- Survey on solid waste management conditions (waste quality and quantity survey, old disposal site survey, public awareness survey)
- Survey on new landfill site development
- Survey on environmental and social considerations

3.5 Consideration of Current Solid Waste Management Activities into the M/P

The Philippine side emphasized that current solid waste management practices such as

For: JICA

source segregation collection, 3R activities at material recovery facilities should be taken into consideration in the M/P, especially improvement of current activities as short-term solutions. The Study Team agreed to consider these matters.

3.6 New Landfill Site Planning

MOM emphasized necessity of phasing plan of the new landfill site so that the site could be available quickly. The Study Team explained that consideration of phasing had been discussed in the draft IC/R already.

Both side also confirmed that topographic survey would be conducted for the whole area of the site. In this connection, MOM promised to show clear boundary of the site for the survey.

3.7 Environmental and Social Considerations

Both sides confirmed that the importance of compliance with Philippine's law on EIA regulations and JICA's Guidelines regarding Environmental and Social Consideration, and public acceptance.

MOM explained that IEE of the new landfill site was prepared and submitted to DENR in February 2007. However, the Study Team explained that IEE may need to be amended because current design as well as design conditions of the site may be changed in the Study. The Philippine side informed the Study Team of ECC for the 1.5 ha of area in the new landfill site would be released by the end of March 2007. The Study Team also explained that if the Philippine side considers application of international donor assistance for the site development, full-scale EIA would be necessary, and the Philippine side understood it.

Both side also confirmed that administrative procedures of IEE/EIA would be done by the Philippine side while technical assistance on IEE/EIA would be provided by the Study Team.

3.8 Finalization of draft IC/R

As the results of discussion, Both sides finally agreed that draft IC/R could be finalized as IC/R taking into consideration the above discussion. The Study Team explained that draft IC/R would be finalized upon receiving the approval from JICA headquarters.

4. Undertakings of MOM and NSWMC

4.1 Office Space and Furniture

The Study Team confirmed that office spaces were being prepared in the Municipality Buildings in Malay and Boracay. MOM promised to arrange enough number of desks and chairs for the Study Team members.

4.2 Issue of ID

As the Study Team members will travel between Boracay and Panay Islands during the Study, the Philippine side was requested to issue IDs so that team members could travel without paying environmental fee and passage fare. MOM promised to issue IDs by the middle of April 2007.

5. Date and Information Collection

The Philippine side agreed to collect necessary data and information until the Study Team members return to the Philippines in the middle of April 2007. The list of necessary data and information was confirmed to be given by the Study Team before they leave the Philippines on March 27, 2007.

Appendix-1: List of Attendants

Appendix-2 List of Counterpart Personnel

For: Ignatius

Panay

6/2

3

List of Attendants**(Philippine side)**

Malay Municipality

Hon. Ceciron S. Cawaling

Mayor, Municipality of Malay

Engr. Arnold L. Solano

Engineer VI, Malay Solid Waste Action Officer

Ms. Alma S. Belejerdo

Municipal Planning and Dev. Coordinator, Malay Municipality

NSWMC

Atty. Zoilo L. Andin, Jr

Executive director, NSWMC

DENR

Eng. Ricardo D. Benjamin

EMB Focal Person

Ms. Delilah S. Maugeri

DENR ESWM Coordinator for Boracay Island

Ms. Immaculate V.

EMB DENR Regional SWM Focal Person for LGUS-06

Juntarciego

Mr. Jonne L. Adaniel

CENRO Representative, DENR-Aklan

BCCI

MA. Lyzzelle M. Ceralde

Boracay Chamber of Commerce & Industry, Inc.

EPG

Dr. MA. Judea M. Millora

Office of the President, Eminent Persons Group

SB MEMBER

Mr. Dante C. Pagsuguiron

SB MEMBER

PTA

Engr. Rommel De Vicente

PTA representative

(Japanese side)

Japan International Cooperation Agency (JICA)

Mr. Shiro Amano

Institute for International Cooperation, Senior Advisor (Waste Management), JICA

Mr. Tomoyuki Uda

Senior Program Officer, Environmental Management Team I, Group II (Environmental Management), Global Environmental Department, JICA

Mr. Kiyofumi Takashima

Assistant Resident Representative, Program Operation Section, JICA Philippine Office

Ms. Minnie M. Dacanay

In-house Consultant, Planning & Coordination Section, JICA Philippine Office

JICA Study Team

Mr. Toshiyuki Ujiie

JICA Study Team (Team leader / Solid Waste Management Plan / Capacity Development)

Mr. Martin Edge

JICA Study Team (Final Disposal Plan)

Mr. Satoshi

JICA Study Team (3R Activity Promotion Plan / Recycling Facility Plan / Coordinator)

Higashinakagawa

Mr. Norihisa Hirata

JICA Study Team (Financial Plan / Private Sector Exploitation Plan)

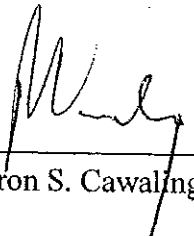
List of Counterpart Personnel

No.	Full Name	Role in the Study	Position
1	Ms. Alma Belejerdo	Director of the Study	Municipal Planning and Dev. Coordinator, Malay Municipality
2	Ms. Delilah Maugeri	Deputy Director of the Study	ESWM Coordinator, Boracay Island
3	Engr. Arnold Solano	Technical Counterpart	Municipal Solid Waste Action Officer, Malay
4	Engr. Manuel de los Reyes	Technical Counterpart	Environmental Management Specialist. Malay
5	Engr. Ricardo Benjamin	Technical Counterpart	EMB Boracay Focal Person
6	Mr. Heherson Alvarez	Technical Counterpart	Ecosystem Management Specialist. EMB

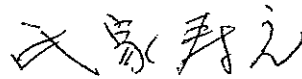
MINUTES OF MEETING
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Boracay Island, July 2, 2007

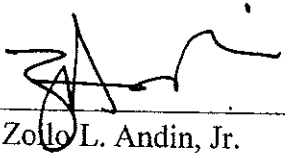


Hon. Ceciron S. Cawaling
Mayor
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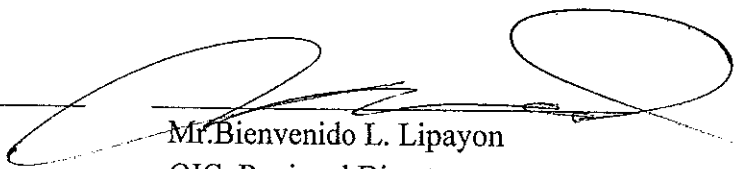


Mr Toshiyuki Ujiie
Team Leader
JICA Study Team

Witness:



Atty. Zollo L. Andin, Jr.
Executive Director
National Solid Waste Management
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The Republic of the Philippines



Mr. Bienvenido L. Lipayon
OIC, Regional Director
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1. Introduction

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This Minutes of Meeting is a record of the 2nd Steering Committee (hereinafter referred to as "ST/C") held on July 2, 2007 for discussion on Progress of the Master Plan on Solid Waste Management for Boracay Island and Malay Municipality in the Philippines (hereinafter referred to as "the Study") and other issues related to the Study that have been agreed upon between the Philippine side and the Japanese side (hereinafter referred to as "Both sides"). The list of attendants to the meeting is attached in Appendix-1. Aside from members of the ST/C, the barangay chairpersons were also invited.

2. Basic Framework of Master Plan

The Study Team presented the following: 1) Key findings from the surveys on waste characterization and public awareness, 2) Basic framework of the 10 years Master Plan (hereinafter referred to as "M/P"), 3) Possible technical options for the solid waste management (hereinafter referred to as "SWM") system, and 4) Preliminary results of the surveys on the closed dumpsite and new sanitary landfill (hereinafter referred to as "SLF"). The main issues on the discussions regarding the basic framework are as follows:

2.1 Basic Framework for the Master Plan

The Study Team discussed the purpose and the contents of the M/P based on the conceptual framework recommended as National Solid Waste Management Framework by NSWMC. It was confirmed that waste avoidance, source reduction and material recovery measures should be promoted at first, and then treatment and residual waste management should be considered following the SWM hierarchy. The vision of the M/P was agreed to set as "A Sustainable Integrated Solid Waste Management System".

The socio-economic projection for the M/P formulation was explained by the Study Team as follows.

- Future population will be projected based on the increasing ratios between 2000-2006
- Several scenarios could be considered for projection of future tourist arrival. If the number of tourist will increase with same increasing numbers of the past three of five years, more than 1.2 million/year tourists are expected to arrive at Boracay Island in 2017.
- Current waste generation in Boracay Island was estimated as approximately 12 tons/day. In the above case, the waste generation of 2017 in Boracay Island was estimated as about double of that of 2007.

The Philippine side suggested the Study Team to set unit generation ratios of hotel and restaurant carefully and to consider future change of characteristics of biodegradable waste as well. The Study Team agreed to set the ratios taking into consideration the result of rainy season survey which was not available at this moment.

Since RA 9003 requires the LGU to divert at least 25% of the all solid waste from waste disposal facilities, it was proposed that targets of the M/P should be set for diversion and disposal. But considering the current collection situation of MOM, collection ratio was also agreed to be included as one of targets.

The Philippine side suggested that the M/P should include cost recovery measures and alternative technologies to further reduce the volume of residual waste. NSWMC also advised that the SWM plans of respective barangays should be reflected in the municipal level M/P.

2.2 Materials Recovery Facility (MRF)

The Study Team explained the preliminary findings from waste characterization survey of the peak season. In addition, the following 4 options for the MRF were suggested considering transportation and construction costs, land acquisition, social acceptance, and organization.

- Option 1: three in Boracay and two in Main Island
- Option 2: two in Boracay and two in Main Island
- Option 3: one in Boracay and two in Main Island
- Option 4: one in Boracay and one in Main Island

After the discussion, the Philippine side expressed their intention to have a centralized MRF in Boracay Island and several cluster MRFs in Main Island. It was also discussed that the centralized MRF could contribute to reduce the costs not only for operation but also for collection and transportation. MOM promised to find a suitable site for the centralized MRF soon.

2.3 Sea Transportation

The Study Team presented that with the present condition of port facilities and the expected volume of residual waste to be transported to the new SLF, the use of a pump boat was considered to be more economical way at present.

2.4 Closed Dump Site

The Study Team showed 3 options for the closed dump site: 1) to leave "as is," 2) to close safely by covering with low permeability cap, or 3) to remove waste and restore land to the original condition. Key issues in option 2 are availability of materials for cover soil and need for re-profiling for slope stability. The Philippine side (DENR and NSWMC) stated that option to do nothing (option 1) was not acceptable, and that before turning over the site to the private owner, MOM was obliged to stabilize the waste, slopes and methane gas generation if any. It was finally concluded that MOM would close the site by covering with low permeability cap (option 2),

negotiate with the private owner to purchase the land and convert the site as an eco-park.

2.5 Final Disposal Plan

The Study Team presented the status on the series of surveys on the new SLF that had been completed and were still being undertaken up to the present. The following issues were raised for the Philippine side to resolve:

- (1) About 0.6-1.0 ha A&D land is subject to a claim by the heirs of Mr. Conrado Acosta.
- (2) Boundaries for timberland, A&D land and administrative area vary on each 'official plan.'
- (3) Part of the site lies within Barangay Mayapay, Buruanga Municipality.
- (4) Part of the A& D land have steep slopes ranging from 1:1, 1:2 and 1:3 and may be needed to be reclassified according to RA 703.
- (5) The site boundary does not adjoin the access road.
- (6) The access road from the provincial road is not paved and has only single lane. It should be paved and the ROW should be 10 meters rather than 6 meters.
- (7) Site slopes are steep as the normal restoration profile or steeper and may require more costly engineering interventions.
- (8) Other questions posed for consideration are: whether only MOM use the new sanitary landfill or together with Buruanga municipality, and type of waste will be disposed of at the site.

As for the access road, MOM said that immediate widening of the road was not necessary but more lots might be acquired for the widening. NSWMC suggested that only residual waste should be disposed of at the landfill site through promoting 3Rs.

2. Public Consultation

The Study Team suggested that necessity of public consultations for the M/P formulation. NSWMC also suggested about ownership of MOM for the M/P formulation. The Philippine side proposed to organize a workshop inviting all the barangay chairpersons and other stakeholders for the discussions. The workshop for the barangays will be scheduled within the month of July, 2007.

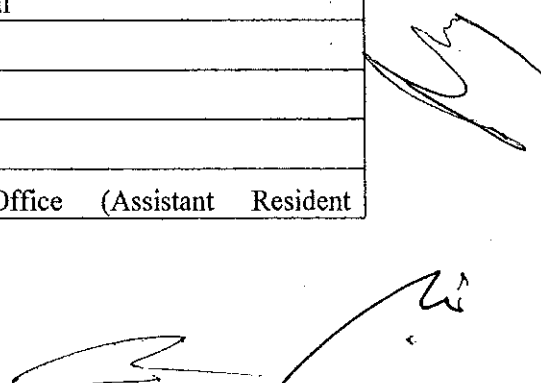
As for the public consultation for the new landfill site development, its necessity was also suggested by the Study Team for amendment of the current IEE. The local people and other stakeholders including Buruanga Municipality were agreed to be invited for the consultation.

3. Steering Committee

It was tentatively agreed that 3rd ST/C would be organized on August 7 or 8, 2007. The agenda will be contents of Interim Report including draft M/P.

Appendix-1: List of Attendants

Attendants	Positions/Organizations
<i>Local Government</i>	
1. Hon. Ceciron Cawaling	Mayor, Municipality of Malay
2. Engr. Arnold Solano	Action Officer, Malay
3. Engr. Manuel de Los Reyes	Environmental Management Services , Environmental Officer, Malay
4. Mr. Glenn Sacapaño	Chairperson, Barangay Balabag
5. Mr. Joel Gelito	Chairperson , Barangay Manoc-manoc
6. Mr. Bonifacio Magliquian	Chairperson, Barangay Kabulihan
7. Mr. Ric Calvario	Chairperson, Malay Poblacion
8. Ms. Myra Oczon	Environmental Management Services (Administrative Officer IV), Malay
9. Ms. Marianne Salvacion	Environmental Management Services, Malay
<i>National Government Agency</i>	
1. Ms. Emy Aguinaldo	Deputy Executive Director, NSWMC Secretariat
2. Mr. Raul Jardin	Project Development Officer, NSWMC
3. Ms. Jeanette Sapilan	Head of SWM Unit, EMB Region VI
4. Ms. Juliet Salubre	Staff of SWM Unit, EMB Region VI
5. Engr. Ric Benjamin	Boracay Focal Person, EMB Region VI
6. Mr. Heherson Alvarez	Ecosystem Management Specialist, PENRO-EMB
7. Mr. Baltazar Gerardo	CENRO
8. Mr. Jonne Adaniel	CENRO-EMS
9. Ms. Imafe N. Ejar	CENRO
10. Ms. Delilah Maugeri	CENRO- ESWM Coordinator Boracay Island
<i>Non-Government Agency(NGOs)</i>	
1. Mr. Peter Bruegger	BCCI, Chairman on Environment
2. Mr. David Goldberg	BCCI, Chairman on Information
3. Ms. Lyzelle Ceralde	BCCI, Secretary General
4. Ms. Charisse Roque	BFI Staff
<i>JICA Philippines Office</i>	
1. Mr. Kiyofumi Takashima	JICA Philippines Office (Assistant Resident

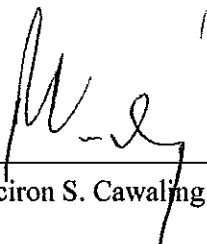


	Representative, Program Operation Section)
<i>JICA Study Team</i>	
1. Mr. Toshiyuki Ujiie	JICA Study Team (Team Leader/Solid Waste Management Plan/Capacity Development)
2. Mr. Martin Edge	JICA Study Team (Final Disposal Plan)
3. Mr. Satoshi Higashinakagawa	JICA Study Team (3R Activity Promotion Plan/Recycling Facility Plan)
4. Mr. Naoki Kudo	JICA Study Team (Waste Sea Transportation Plan)
5. Mr. Takashi Kaji	JICA Study Team (Environment and Social Considerations/Health Care Waste Management)
6. Dr. Ma. Judea Millora	JICA Study Team (Local Expert)
7. Mr. Jerry Rita	JICA Study Team (Local Expert)
8. Ms. Emadelyn Quiñones	JICA Study Team (Local Expert)
9. Mr. Glenn Mijares	JICA Study Team (Local Expert)
10. Ms. Jessica Cordero	JICA Study Team (Local Assistant)

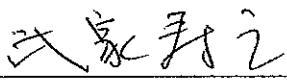
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MUNICIPALITY OF MALAY,
NATIONAL SOLID WASTE MANAGEMENT COMMISSION,
AND
JICA STUDY TEAM

Boracay Island, 14th August 2007

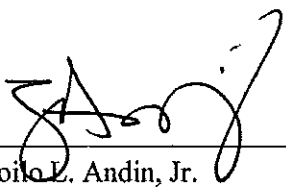


Hon. Ceciron S. Cawaling
Mayor
Municipality of Malay, Aklan
The Republic of the Philippines

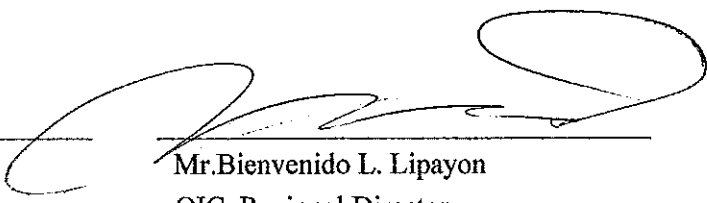


Mr Toshiyuki Ujiie
Team Leader
JICA Study Team

Witness:



Atty. Zoilo L. Andin, Jr.
Executive Director
National Solid Waste Management Commission
(NSWMC)-Secretariat
The Republic of the Philippines



Mr. Bienvenido L. Lipayon
OIC, Regional Director
Environmental Management Bureau
Region VI

1. Introduction

The Japan International Cooperation Agency (hereinafter referred to as "JICA") has organized and dispatched the JICA Study Team (hereinafter referred to as "the Study Team") to the Philippines since March 20, 2007, according to the Implementing Arrangement among Municipality of Malay (hereinafter referred to as "MOM"), National Solid Waste Management Commission (hereinafter referred to as "NSWMC") and JICA signed on 14th February, 2007.

This Minutes of Meeting is a record of the 3rd Steering Committee (hereinafter referred to as "ST/C") held on August 14, 2007 for discussion on Interim Report (hereinafter referred to as "IT/R") for the Master Plan on Solid Waste Management for Boracay Island and Malay Municipality in the Philippines (hereinafter referred to as "the Study") and other issues related to the Study that have been agreed upon between the Philippines side and the Japanese side (hereinafter referred to as "Both sides"). The list of attendants to the meeting is attached in Appendix-1. Aside from the ST/C members, barangay chairpersons and Sangguniang Bayan (hereinafter referred to as "SB") members were also invited for the discussion.

2. Submission and Explanation of IT/R Report

The Study Team submitted twenty (20) sets of copies of the IT/R consisting of Main Report and Supporting Report to MOM, NSWMC and other organizations concerned on August 14, 2007, and explained the contents of the IT/R to them.

3. Contents of IT/R

At this ST/C, Both sides discussed the contents of the IT/R and made further clarifications about the Study. The main issues on the discussions regarding the IT/R are as follows:

3.1 Composition of IT/R

The Study Team explained that they prepared the IT/R based on the Annotated Outline for LGU Solid Waste Management Plans issued by NSWMC, in principle. The Department of Environment and Natural Resources (hereinafter referred to as "DENR") asked that more detail descriptions on the current efforts on SWM by MOM and barangays and the results of waste analysis and characterization survey should be discussed in the M/P. As for the executive summary, DENR suggested that all items should be included in the summary.

The Study Team proposed that they would make the DF/R more simple composition so that the report would be able to be read easily. NSWMC said that if the M/P covers whole contents in the Annotated Outline, the composition of M/P could be changed.

3.2 Overall Framework of the M/P

The Study Team explained the overall framework of the M/P. The following were confirmed

made among the participants. However, the DENR again asked that more detail descriptions on the results of waste analysis and characterization survey should be discussed in the M/P including setting the targets. The Study Team agreed to discuss the said descriptions in the coming report.

1) Future framework

- Population projection: based on the past population growth rate between 2000-2006
- Tourist number projection: based on the trend of the past tourist increasing rates between 2004-2006 for foreigner and 2002-2006 for Filipino.

2) Solid Waste Generation

- Unit generation rates (UGRs): as per discussed in the IT/R.
- Solid waste generation projection: UGRs are assumed to increase as per discussed in the IT/R.

3) Targets

a. Diversion

- Boracay Island: compostable and recyclable wastes are treated inside the island
- Panay Island: compostable and recyclable wastes are diverted as much as possible

b. Collection

- Boracay Island: achieving almost 100% as per required in RA9003
- Panay Island: achieving almost 100% except for rural barangays as per required in RA9003

3.3 Proposed Projects in the M/P

The Study Team explained the proposed projects in the M/P. The following discussion was made among the participants.

(1) Establishment of MRFs

As per discussed at 2nd ST/C, the centralized MRF in Boracay Island has been proposed in the M/P assuming that the candidate site is located in Barangay Manoc-Manoc. The Japanese side asked the Philippine side to explain the availability of candidate site of the centralized MRF. The Philippine side promised that they would coordinate with landowner and provide decided location of the MRF to the Japanese side as an official letter within one month.

(2) Development of Kabukihan Sanitary Landfill

The Study Team explained that basic planning concept of the proposed new sanitary landfill based on the assumption that the whole proposed site (6.5ha) can be used for the landfill. However, since about 1.0 ha A&D land of the site has been claimed by the heirs of Mr. Conrado Acosta, the Philippine side was requested to clarify the status of availability of the land. The Study Team explained that they would suspend design works of the new sanitary landfill until the status is clarified officially. The Philippine side explained that they would submit the Japanese side with a copy of order amending the claim of the heirs of Mr. Conrado Acosta, segregating the identified area for the landfill site and awarding said area for the government use. DENR also promised to issue special land use permit for the use of the timberland area.

As the results, the Philippine side promised to provide the official document on the land status within one month to the Japanese side.

(3) Closure of Old Dump Site

As per discussed at the 2nd ST/C, the idea of development of Eco-park at the old dumpsite after the closure work, which was proposed by MOM, was re-confirmed by Both sides. MOM expressed again their intention to purchase the land for development of the Eco-park.

3.4 Estimated Cost and its Recovery

The Study Team explained the estimated costs for implementation of the projects proposed in the M/P although the costs in the IT/R would be revised reflecting the results of feasibility study etc. NSWMC said that they would also check the cost including its breakdown and assumptions.

The cost recovery system was also discussed among the participants including proposed improvement/revision of the Environment and Admission Fee (hereinafter referred to as "EAF") and Garbage Collection Fee (hereinafter referred to as "GCF") systems. DENR suggested that possibility of increase of GCF and penalty. Tipping fee was also raised as a possible funding source if the new landfill site receives the waste from Municipality of Buruanga. The Study Team replied that cost impacts by the revision of GCF and penalty would be limited and the fees being imposed on the business entities were relatively high. But, the Study Team proposed that GCF would be imposed on the households in the future.

The Philippine side promised to discuss the idea of cost recovery including possibility of revision of the EAF at the SB and provide their idea to the Japanese side within one month.

3.5 Finalization of the M/P

As the results of discussions, the Study Team agreed to revise the M/P taking into consideration the above discussions. The Study Team also explained that they would revise the M/P reflecting the results of feasibility study and further collected data and information, etc. In this connection, the Philippine side was requested to read the IT/R carefully and provide the Study Team with further comments within one month. Especially NSWMC was requested to review the IT/R from the view point of official approval of the M/P. MOM also said that they would discuss the M/P at the Municipal Solid Waste Management Board and SB.

3.6 Sludge from Sewerage Treatment Plan

The Study Team suggested that it was not good idea to treat the sludge from the sewerage plant together with biodegradable waste, because it is rather difficult to handle both of them simultaneously. So, the Study Team recommended that appropriate roof and drainage system should be arranged at the sludge drying facility in order to mitigate impacts on the surrounding environment.

4. Preparation for Implementation of the M/P

Since the proposed M/P is expected to start from the FY 2008, the budget allocation including funding source identification for the implementation of the proposed projects is urgently needed by MOM for the FY 2008. MOM was recommended to start necessary procedures soon including approval at Municipal Solid Waste Management Board and then SB of MOM.

5. Study Schedule

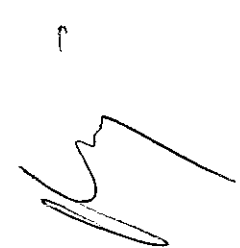
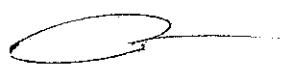
The Study Team explained that the Phase 2 study was scheduled to start from the late of September 2007. As per discussed, the Philippine side was requested to provide an official document regarding the following issues. The official document was requested to send to the JICA Philippine office by September 14, 2007.

- Location of the proposed centralized MRF
- Status of the land for the proposed new sanitary landfill
- Possibility to receive the waste from Municipality of Buruanga
- Idea of cost recovery system
- Comments on the IT/R

6. Feasibility Study in Phase 2

The target projects of feasibility study in Phase 2 were tentatively decided as follows: However, it was agreed that the final decision of the targets would be made by JICA upon receiving the above official document from the Philippine side.

- Development of Kabulihan Sanitary landfill
- Development of Manoc-Manoc Centralized MRF
- Closure of Old Dump Site



Appendix-1

List of Attendants

(Philippine side)

Malay Municipality

Hon. Ceciron S. Cawaling	Mayor, Municipality of Malay
Hon. Gideon Sinel	SB Committee on Environment
Engr. Arnold L. Solano	Engineer VI, Malay Solid Waste Action Officer
Dr. Adrian Salaver	Municipal Health Officer
Mr. Glen Sacapano	Barangay Captain, Balabag
Mr. Eddie Gumboc	Barangay Captain Dumlog
Mr. Joel Gelito	Barangay Captain, Manoc-manoc
Mr. Bonifacio Magliquian	Barangay Captain, Kabulihan
Mr. Ric Calvario	Barangay Captain, Malay Poblacion
Mr. Dionisio Salme	Kagawad, Balabag
Ms. Myra Oczon	EMS, Administrative IV
Ms. Marianne Salvacion	EMS, Administrative IV
Mr. Anery Solano	Municipal Agriculturist

NSWMC

Atty. Zoilo L. Andin, Jr	Executive Director, NSWMC
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DENR

Director Bienvenido Lipayon	Regional Director, DENR-EMB, Region 6
Director Alicia Lustica	Regional Technical Director Research , DENR Region 6
Ms. Edna Loesin	Chief, Planning Management Division, DENR Region 6
Mr. Raul Lorilla	DENR-Provincial Environment Officer
Ms. Jeannete Sapilan	Head, Solid Waste Management Unit, DENR-EMB Region 6
Eng. Ricardo D. Benjamin	EMB Focal Person
Ms. Delilah S. Maugeri	DENR ESWM Coordinator for Boracay Island
Mr. Jonne L. Adaniel	CENRO Representative, DENR-Aklan

EPG

Ms. Consuelo N. Padilla	Office of the President, Eminent Persons Group
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BCCI

MA. Lyzzelle M. Ceralde	Boracay Chamber of Commerce & Industry, Inc.
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BFI

Ms. Loubelle Cann	Boracay Foundation, Inc.
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PTA

Engr. Rommel De Vicente	PTA representative
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Others

Maria J. Magpusao, MD, MPH

Chief, Technical Services Division, Provincial Health Office, Aklan

Lou A. Santa Maria Provincial Health Office
Mr. Roger Debuque Provincial Health Office
Mr. Hilario T. Briones Provincial Health Office

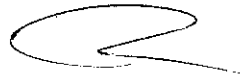
(Japanese side)

Japan International Cooperation Agency (JICA)

Mr. Shiro Amano Institute for International Cooperation, Senior Advisor
(Waste Management), JICA
Mr. Tomoyuki Uda Senior Program Officer, Environmental Management Team
I, Group II (Environmental Management), Global
Environmental Department, JICA
Mr. Kiyofumi Takashima Assistant Resident Representative, Program Operation
Section, JICA Philippine Office

JICA Study Team

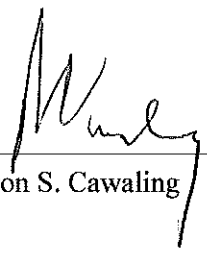
Mr. Toshiyuki Ujiie JICA Study Team (Team leader / Solid Waste Management
Plan / Capacity Development)
Mr. Martin Edge JICA Study Team (Final Disposal Plan)
Mr. Satoshi Higashinakagawa JICA Study Team (3R Activity Promotion Plan / Recycling
Facility Plan / Coordinator)
Mr. Norihisa Hirata JICA Study Team (Financial Plan / Private Sector
Exploitation Plan)
Dr. Ma. Judea G. Millora JICA Study Team (Local Expert)




MINUTES OF MEETING
OF
4th STEERING COMMITTEE
FOR
THE MASTER PLAN ON SOLID WASTE MANAGEMENT
FOR BORACAY ISLAND AND MALAY MUNICIPALITY
IN
THE REPUBLIC OF THE PHILIPPINES

AGREED UPON AMONG
MUNICIPALITY OF MALAY,
NATIONAL SOLID WASTE MANAGEMENT COMMISSION,
AND
JICA STUDY TEAM

Boracay Island, 19th October 2007

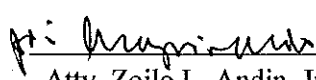


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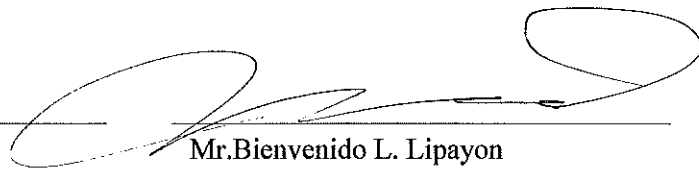


Mr Toshiyuki Ujiie
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The Republic of the Philippines



Mr. Bienvenido L. Lipayon
Regional Director
Environmental Management Bureau
Region VI

1. Introduction

The Japan International Cooperation Agency (hereinafter referred to as "JICA") has organized and dispatched the JICA Study Team (hereinafter referred to as "the Study Team") to the Philippines since March 20, 2007, according to the Implementing Arrangement among Municipality of Malay (hereinafter referred to as "MOM"), National Solid Waste Management Commission (hereinafter referred to as "NSWMC") and JICA signed on 14th February, 2007.

This Minutes of Meeting is a record of the 4th Steering Committee (hereinafter referred to as "ST/C") held on October 19, 2007 for discussion on various issues related to the Study that have been agreed upon between the Philippine side and the Japanese side (hereinafter referred to as "Both sides"). The list of attendants to the meeting is attached in Appendix-1. Aside from the ST/C members, barangay chairpersons and Sangguniang Bayan (hereinafter referred to as "SB") members were also invited for the discussion.

2. Issues to be Clarified about the Study

At this ST/C, Both Sides confirmed the status of the following issues to be clarified about the Study as per discussed at the 3rd ST/C.

- Development of Kabulihan Sanitary Landfill (status of the land)
- Development of a Centralized MRF in Boracay (location of the MRF)
- Receiving the waste from Municipality of Buruanga
- Costs and its' recovery of the Master Plan

(1) Development of Kabulihan Sanitary Landfill

The Philippine side explained the progress for the resolution of land issue which had been raised by claim of Mr. Conrado Acosta, with regard to the proposed Kabulihan Sanitary Landfill (hereinafter referred to as "the SLF") as per summarized in Appendix 2.

MOM also explained that when a certificate for the "Order for the Immediate Cancellation of Survey Plan FP-060405-006865 issued heirs of Conrado Acosta" from Regional Executive Director, DENR-6 for Regional Technical Director - Land Management Services, DENR-6 dated on October 4, 2007, the process of resolution for land issue by the government would be finished.

(2) Development of a Centralized MRF in Boracay

A centralized MRF in Boracay Island has been proposed in the Master Plan (hereinafter referred to as "M/P") assuming that the candidate site is located in Barangay Manoc-Manoc. The Philippine side expressed their intention to develop the centralized MRF by expanding the existing Manoc-Manoc MRF at the 3rd ST/C.

The Philippine side explained that the barangay captain of Manoc-Manoc committed to secure a 1.0 ha land for the centralized MRF and to proceed with the development.

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(3) Receiving Waste from Municipality of Buruanga

The Philippine side explained that MOM would receive the solid waste from Municipality of Buruanga (hereinafter referred to as "MOB") at the SLF, if MOB will bring the residual waste after the proper segregation. For this, EMB may assist MOB to establish a MRF for the segregation. Since necessity of payment of tipping fee by MOB was also suggested by MOM, the Study Team agreed to support to set the fee. However, it was confirmed by Both Sides that the waste to be brought from MOB would not be taken into consideration in the study because the amount of the waste was considered to be negligible small compared with the one from Boracay.

(4) Costs and its' Recovery of the Master Plan

The Philippine side explained that they had discussed the costs proposed for the M/P and they requested the Study Team to re-consider the costs such as the ones for the development of the SLF, MRFs and implementation of IEC. NSWMC has also expressed their concern about the costs especially for the development of the SLF.

3. Closure of Old Dump Site

The Philippine side explained that since the land owner of the old dump site proposed PHP 7,500/m² for selling the land to MOM, MOM abandoned the procurement of the land and the development of an Eco-park there. However, the Department of Environment and Natural Resources (hereinafter referred to as "DENR") said that even though the MOM would not procure the land, MOM has the responsibility to rehabilitate the site according to the requirement of R.A. 9003.

On the other hand, the question was raised about Green Philippine Program which was supposed to be initiated for about 14 ha at Boracay Island covering the old dump site by a NGO, the Island Green Foundation Inc., based on the Memorandum of Agreement between DENR and the NGO dated August 6, 2007. Since the detail of this program was not clear, it was decided by Both Sides that the program would not be taken into consideration in the study.

Finally, it was confirmed by Both Sides that rehabilitation of the site would be planned assuming that an Eco-park or other similar utilization would be planned as part of the post closure activities.

4. Comments on Interim Report

The Study Team explained the comments on the Interim Report (hereinafter referred to as "IT/R") which they had received so far. The major comments received and answers are as follows;

(1) Costs and its Recovery

The Study Team explained the comments that they had received on the estimated costs for the M/P as follows:

- The estimated costs for the M/P were relatively high compared with the capacity of

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MOM.

- The solid waste management system needs to be established within the current budgetary framework, as much as possible.
- The costs should be broken down based on each polluter's contribution (resident, tourist, etc.) in view of the polluter pays principle.
- The M/P heavily depending on the Environment and Admission Fee was rather risky for MOM if unexpected incidents which may lead to the decrease in the number of tourists happen.

For these comments, the Study Team agreed to review the proposed projects in the M/P including contents and necessity of the proposed projects, and to propose the revised M/P by reducing the costs. The Study Team also agreed to re-examine the costs reflecting the results of the feasibility study, especially for the Centralized MRF and the SLF.

(2) Composition of the JICA Study Report

The Study Team explained that they had received comments on the composition of the report from JICA. For this, the Study Team explained proposed composition of the report as follows:

- Part I: General
- Part II: Proposed 10-year Solid Waste Management Plan
- Part III: Feasibility Study
- Part IV: Recommendations

And also as per discussed at the 3rd ST/C, the Study Team proposed to simplify the composition of the 10-year Solid Waste Management Plan covering the contents described in the annotated outline.

(3) Compliance with Annotated Outline

The Study Team explained that they had received the initial evaluation of the M/P in view of the requirements for the approval of the 10-year Solid Waste Management Plan from NSMWC and promised to develop the 10-year Solid Waste Management Plan incorporating the comments.

5. Contents and Schedule of Phase 2

(1) Targets of Feasibility Study

As the result of the above discussions, the target projects of feasibility study in Phase 2 were confirmed as follows:

1) Development of Kabulihan Sanitary Landfill

Although the resolution process for the land issues is still in progress, the Japanese side confirmed the intention and efforts of the Philippine side for development of the SLF. In addition, because of the time constraints of the study, the Study Team explained that the feasibility study on the SLF would proceed with design works based on the assumption that the whole proposed site (6.25 ha)

can be used for the SLF. In this connection, it was confirmed by Both Sides that if the land issue would not be resolved and the amendment of the study result would be needed, the Philippine side should conduct necessary amendment by themselves. It was also suggested by JICA that the Philippine side should actively participate to the feasibility study so that they can learn the study methods.

In addition, NSWMC asked to minimize the cost of the facility and to consider phasing development based on Category 1 of DAO 10, Series 2006 for the initial cell subject to field conditions and monitoring results.

2) Development of Manoc-Manoc Centralized MRF

Since the Philippine side expressed their commitment to develop the proposed Centralized MRF by expanding the existing Manoc-Manoc MRF, the Study Team said that they would convey the request for feasibility study of the Manoc-Manoc Centralized MRF to JICA headquarters for the final decision. In this connection, the Study Team suggested that the phasing development plan of the MRF would be made in consideration for the necessary time to arrange the land and transition of the current systems. The Study Team also agreed to check efficiency of the centralized MRF during the feasibility study.

3) Closure of Old Dump Site

It was confirmed by Both Sides that the feasibility study on closure of old dump site would be conducted as per discussed.

(2) Contents and Schedule of Phase 2

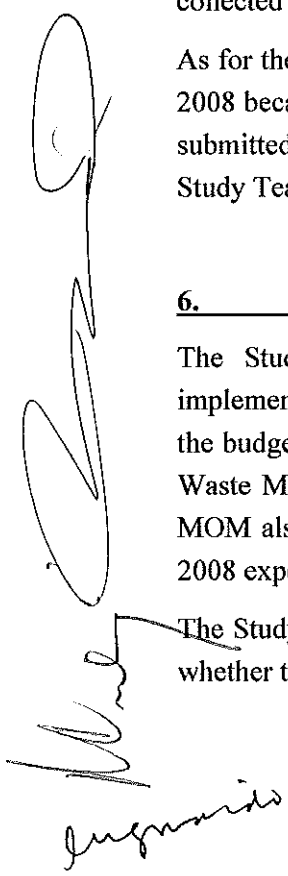
In addition to the feasibility study, the Study Team also explained that they would revise the M/P taking into consideration the comments on the IT/R, the results of feasibility study and further collected data and information, during Phase 2.

As for the study schedule of Phase 2, the study period will be extended until the middle of March 2008 because of the delay of the reply from the Philippine side. In this connection, DF/R will be submitted at the end of January 2008, while F/R will be middle of March 2008. However, the Study Team promised to try to submit the draft of DF/R as early as possible for the review.

6. Preparation of Budget for Implementation of the M/P

The Study Team asked the Philippine side about status of budget preparation for the implementation of the M/P which is expected to start from the FY 2008. MOM explained that the budget for solid waste management of FY 2008, which was approved by the Municipal Solid Waste Management Board of MOM held on September 25, 2007, was PHP 18 million in total. MOM also explained that the approved budget covered various activities to be conducted in FY 2008 expect for development of the SLF which may be implemented by the other funding source.

The Study Team requested MOM to check the contents of the budget together in order to clarify whether the planned activities of the M/P were included or not.



7. Others

The Japanese side proposed to organize technology transfer seminar at the end of Phase 2. The Philippine side agreed to that idea and promised to support the Japanese side for the seminar.

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signature

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Appendix-1

List of Attendants

(Philippine side)

Malay Municipality

Hon. Ceciron S. Cawaling	Mayor, Municipality of Malay
Hon. Gideon Siñel	SB, Committee on Environment
Hon. Cristina Prado	SB, Committee on Finance
Engr. Arnold L. Solano	Engineer VI, Malay Solid Waste Action Officer
Ms. Alma Belejerdo	MPDO
Engr. Manuel de los Reyes	Environmental Officer, Malay
Dr. Adrian Salaver	Municipal Health Officer
Mr. Glenn Sacapano	Barangay Captain, Balabag
Mr. Joel Gelito	Barangay Captain, Manoc-manoc
Mr. Bonifacio Magliquian	Barangay Captain, Kabulihan
Mr. Hector Casidsid	Barangay Captain, Yapak
Mr. Ric Calvario	Barangay Captain, Malay Poblacion
Mr. Eddie Gumboc	Barangay Captain Dumlog
Evan Jay Aliansa	Administrative Assistant V
Mr. Jahaziel Gelito	Municipal, Interior Local Government

NSWMC

Ms. Emy Aguinaldo	Deputy Director
Ms. Margarita Caridad	Engineer III, NSWMC

DENR

Director Bienvenido Lipayon	Regional Director, DENR-EMB, Region 6
Mr. Raul Lorilla	Provincial/Community Environment Officer
Ms. Jeannete Sapilan	Head, Solid Waste Management Unit, DENR-EMB Region 6
Mr. Merwin Cabales	PENRO Office

BCCI

Ms. Lyzzelle M. Ceralde	Boracay Chamber of Commerce & Industry, Inc.
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BFI

Ms. Loubelle Cann	President, Boracay Foundation, Inc.
Ms. Lara Salaver	Boracay Foundation, Inc.

(Japanese side)

Japan International Cooperation Agency (JICA)

Mr. Kiyofumi Takashima	Assistant Resident Representative, Program Operation Section, JICA Philippine Office
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JICA Study Team

Mr. Toshiyuki Ujiie

JICA Study Team (Team leader / Solid Waste Management Plan / Capacity Development)

Mr. Satoshi Higashinakagawa

JICA Study Team (3R Activity Promotion Plan / Recycling Facility Plan / Coordinator)

Dr. Ma. Judea G. Millora

JICA Study Team (Local Expert)

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Below it, the name "Satoshi Higashinakagawa" is written vertically.
At the bottom left, the name "Judea G. Millora" is written vertically.

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Appendix-2: Progress of Resolution for Land Issue at the Kabulihan SL (August 1 to October 15, 2007)

Date	Subject	From	For
August 1, 2007	Investigation Report re: Amendment of Approved Plan FP-060405-006865 in the name of the heirs of Conrado Acosta situated in Barangay Mayapay, Buruanga, Aklan	Special Investigator Pedy de Pedro	Regional Technical Director-Land Management Services, DENR- Region 6
August 2, 2007	Survey Returns re: Amendment of the Approved Plan FP-060405-006865 in the name of the heirs of Conrado Acosta situated in Barangay Mayapay, Buruanga, Aklan	PENR Officer, Kalibo, Aklan Officer-in-charge, CENR Officer, Kalibo, Aklan	Regional Technical Director-Land Management Services, DENR- Region 6
September 4, 2007	Notice of agreement and conformity to the boundaries between Acosta claims and the proposed SLF site set by survey of Engr. Vivien Alvarez	Regional Executive Director DENR- Region 6	Mayor Ceciron Cawaling
September 5, 2007	Subdivision Plan for a parcel of land surveyed in the name of the heirs of Conrado Acosta and sanitary landfill site located at Barangay Mayapay, Buruanga, Aklan	PENR-CENR Officer, Kalibo, Aklan	Regional Executive Director DENR- Region 6
September 11, 2007	Amendment of the Plan of the heirs of Conrado Acosta requiring consent of adjoining claimants/owners	Regional Technical Director-Land Management Services, DENR- Region 6	PENR-CENR Officer, Kalibo, Aklan
September 12, 2007	Request for Cancellation of Approved Survey Plan for a parcel of land surveyed in the name of the heirs of Conrado Acosta	PENR-CENR Officer, Kalibo, Aklan	Regional Technical Director-Land Management Services, DENR- Region 6
September 14, 2007	Subdivision /Amendment of FP-060405-006865 in the name of the heirs of Conrado Acosta located at Mayapay, Buruanga, Aklan	Regional Technical Director-Land Management Services, DENR- Region 6	PENR-CENR Officer, Kalibo, Aklan
September 14, 2007	Request for the Approval of the Amendment Plan Prepared for the heirs of Conrado Acosta and for the Cluster Sanitary Landfill Site	Engr. Vivien Alvarez Special Investigator Pedy de Pedro	PENR-CENR Officer, Kalibo, Aklan
September 17, 2007	Submission of written explanation for land status certification of a tract of land situated at Barangay Mayapay, Buruanga as alienable and disposable	CDA Pablito Manzaretta CENRO, Kalibo	PENR-CENR Officer, Kalibo, Aklan
September 18, 2007	Explanation of issuance of certification of land status of a tract of land situated at Barangay Mayapay, Buruanga as alienable and disposable contrary to its actual classification as Timberland	Oriel T. Tesorero Forest Management Specialist	PENR-CENR Officer, Kalibo, Aklan
September 25, 2007	Request for cancellation of approved survey plan for a parcel of land surveyed in the name of heirs of Conrado Acosta	PENR-CENR Officer, Kalibo, Aklan	Regional Executive Director DENR- Region 6
October 4, 2007	Order for the immediate cancellation of Survey Plan FP-060405-006865 issued to heirs of Conrado Acosta	Regional Executive Director DENR- Region 6	Regional Technical Director-Land Management Services, DENR- Region 6

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**PART II: 10-YEAR SOLID WASTE
MANAGEMENT PLAN**

A: PUBLIC AWARENESS SURVEY

PART II-A: PUBLIC AWARENESS SURVEY

1 Introduction

Boracay Island belongs to the Municipality of Malay (MOM) in Aklan Province and has become the most popular tourist resort in the Philippines. The number of tourists has increased year by year and reached approximately 500,000 in 2006. In line with this, the amount of solid waste generated has rapidly increased and become one of the most serious problems on the Island. The solid waste management SWM of the MOM is in a critical situation.

With this background, the Government of the Philippines requested the Government of Japan to conduct “The Master Plan on Solid Waste Management for Boracay Island and the Municipality of Malay in the Republic of the Philippines (the Study)”. In the Study, “Survey on Public Awareness on Solid Waste Management” is a vital component to identify the public awareness on SWM in the process of the preparation of the 10-year SWM Plan.

2 Objectives

The survey aimed to:

1. Identify the discharge condition of public and business sectors in terms of solid waste;
2. Provide data on awareness on the needs in solid waste management, the degree of satisfaction of the public and business sectors on solid waste management; and
3. Assess the environmental awareness and willingness to pay of tourists, as well as residents, with regard to solid waste management.

3 Scope of Work

The survey consisted of interview survey of households and business establishments on Boracay Island and the Municipality of Malay and tourists on Boracay Island.

4 Methodology of the Study

The interview surveys were conducted using a questionnaire designed for each of the sectors identified. The number and distribution of the respondents for each sector is presented in Table A.4-1. One-on-one interviews were conducted in these sectors using the prepared questionnaires.

Table A.4-1 Number and Distribution of the Survey Respondent

Target Sector	Area	Number of Samples / Respondents	Total Sample Per Sector
Residents (Households)	Boracay Island	120	150
	Mainland of Malay	30	
Business Sectors	Boracay Island	80	100
	Mainland of Malay	20	
Tourist (Local and Foreign)	Boracay Island	100	100
Total Respondents		350	350

Source: JICA Study Team

4.1 Sampling Procedure

The procedure for selecting the respondents for the interview depended on the target sectors that were interviewed, i.e., residents/households, business establishments and tourists.

Household/Residents Survey adopted a random sampling procedure to select the target respondents. After selection, the 120 target respondents were distributed equally to the three barangays on Boracay Island (Brangay Yapak, Brangay Balabag and Brangay Manoc-Manoc).

Using available household listings at the barangay level, 120 households were randomly selected and identified as respondents. A total of 30 household respondents were identified from each of the barangay on the Island. Replacement samples (about 10% of total households) were also selected in case the drawn sample households were not available at the time of actual visit for interview.

The same procedure was undertaken for the 30 respondents required on the Mainland of Malay but was limited only to two (2) barangays of Malay due to the small number of respondents. As identified during the mobilization meeting, the target barangays on the Mainland of Malay, Aklan were in Poblacion and Balusbos with 15 household respondents for each.

Business Establishments Survey also adopted a random sampling procedure considering the proportion of the type of business. The list of business establishments on Boracay and the Mainland of Malay were collected on the Municipal Planning and Development Office (MPDO) and were distributed according to the type of business. The required 80 respondents were distributed according to the proportion of the type of business and were randomly selected within the same business type categories. The same procedure was used in selecting business establishment respondents for the areas.

Table A.4.1-1 Number of Registered Businesses and their Proportion

Business Type	No. of Businesses Registered*	Proportion (%)	Dist'n of Resp. (n = 80)
Hotels	175	17.4	14
Restaurants	210	20.9	17
Market Vendors	350	34.8	28
Souvenir Shops	180	17.9	14
Grocery Stores	90	9.0	7
Total	1,005	100	80

Source: MPDO

Tourist Survey used purposive sampling. Respondents were selected and identified on Boracay Island. The 100 samples were distributed to 50 local tourists and 50 foreign tourists. Each of the field interviewers was provided a base map on Boracay Island and the Mainland of Malay where the locations and areas of the respondents that were interviewed were plotted.

The actual number of respondents interviewed is shown in Table A.4.1-2 below.

Table A.4.1-2 Actual Number of Respondents Interviewed

Target Sector	Area	Target Number of Respondents		Actual Number of Respondents Covered	
		Total Sample Per Sector	Number of Samples Required	Total Respondents Per Sector	Number of Respondents
Business Establishments	Boracay Island	100	80	101	80
	Mainland of Malay		20		21
Household/ Residents	Boracay Island	150	120	162	132
	Mainland of Malay		30		30
Local & Foreign Tourist	Boracay Island	100	100	133	133
Total Respondents		350	350	396	396

Source: JICA Study Team

4.2 Interview Procedures and Time Schedule

The survey commenced with the training of the survey interviewers using questionnaires. Each questionnaire was discussed in detail with regard to each question and proper interviewing techniques were discussed. After the discussions on the individual questionnaires, mock interviews were conducted to practice. Afterwards, a pre-test of the questionnaires was conducted. Appropriate revisions were then made to the questionnaires based on the results of the pre-test. After the approval of the final version of the questionnaires, actual interviews were conducted on Boracay Island and the Mainland of Malay for the household and business establishments and on Boracay Island for the tourists. A field interview manual was also prepared to aid the interviewers during the conduct of the interview.

5 Results and Discussion

5.1 Household Survey

5.1.1 General Information

(1) Household Information

A total of 162 household respondents were interviewed. Three barangays on Boracay Island were covered as well as two barangays on the Mainland of Malay.

Table A.5.1-1 and Table A.5.1-2 present the profile of the respondents on the Boracay Island and the Mainland of Malay. The majority of the respondents from the survey were household heads of the family where 69% were in Barangay Balabag, 72% in Barangay Manoc-Manoc and 68% in Barangay Yapak.

As a whole, 68% of the respondents on the Boracay Island were household head, 29% were spouses and the remaining 3% were other members of the family, i.e. children and grandparents of the family. On the other hand, the respondents on the Mainland of Malay were also household head of the family where 67% in Barangay Balusbos and 80% in Barangay Poblacion.

In terms of number of dependents within the household, majority of the household respondents belong to the lower range (Between 0-3), 45% in the barangays on Boracay Island and 73% in the Mainland of Malay. The average number of dependents per household is 4.1 on Boracay Island and 3.7 on the Mainland of Malay.

Table A.5.1-1 General Household Profile of 132 Respondents on Boracay Island

Item	Balabag		Manoc-Manoc		Yapak		Boracay Island	
	No.	RatePercent	No.	Percent	No.	Percent	No.	Percent
Household Position								
Household Head	29	69	34	72	27	63	90	68
Spouse	10	24	13	28	15	35	38	29
Others	3	7	0	0	1	2	4	3
Total	42	100	47	100	43	100	132	100
Number of Family Dependents								
Between 0 to 3	23	55	25	53	12	28	60	45
Between 4 to 6	17	40	16	34	21	49	54	41
More than 6	2	5	6	13	10	23	18	14
Total	42	100	47	100.00	43	100	132	100
Average Number of Dependents	3.4		4.0		4.9		4.1	
Lowest Number of Dependents	1		0		0		0	
Highest Number of Dependents	8		10		10		10	

Source: JICA Study Team

Table A.5.1-2 General Household Profile of 30 Respondents on the Mainland of Malay

Item	Balusbos		Poblacion		Mainland Malay	
	No.	Percent	No.	Percent	No.	Percent
Household Head	10	66.67	12	80.00	22	73.33
Spouse	4	26.67	2	13.33	6	20.00
Others	1	6.67	1	6.67	2	6.67
Total	15	100.00	15	100.00	30	100.00
Between 0 to 3	10	66.67	7	46.67	17	56.67
Between 4 to 6	5	33.33	5	33.33	10	33.33
More than 6	0	0.00	3	20.00	3	10.00
Total	15	100.00	15	100.00	30	100.00
Average	2.8		4.53		3.67	
Lowest Number of Dependents	0		2		0	
Highest Number of Dependents	5		11		11	

Note: All respondents were sampled in sitio proper of the barangays

Source: JICA Study Team

Majority of the sampled respondents in Barangay Balabag were from Sitio Proper (50%), Barangay Manoc-Manoc in Sitio Cagban (23%) and in Barangay Yapak in Zone (33%) due to the number of families from these sitios and zones. On the other hand, all of the sampled residents on the Mainland of Malay were taken from the Sitio Proper of Barangay Poblacion and Balusbos based from the geographical considerations between these barangays.

(2) Respondent Profile

Majority of the respondents from the household survey were male (61%) on Boracay Island and 60% on the Mainland of Malay (Table A.5.1-3). Majority of the respondents' age belongs to the productive years of age between 31 to 45 years old, 44% on Boracay Island and 40% on the Mainland of Malay. The average age of the respondents interviewed were 39.11 years old and 51.80 years on both Boracay Island and the Mainland of Malay, respectively.

With regard to educational attainment, majority of the respondents were high school graduates. Some 15% on Boracay Island have college degrees. On the other hand, 37% on the Mainland of Malay finished college.

Table A.5.1-3 General Profile of Respondents Interviewed

Item	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland of Malay	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Distribution of Gender														
Male	23	54.76	30	63.83	28	65.12	81	61.36	7	46.67	11	78.57	18	60.00
Female	19	45.24	17	36.17	15	34.88	51	38.64	8	53.33	4	28.57	12	40.00
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00
Distribution of Age (Years)														
18-30	14	33.33	12	25.53	8	18.60	34	25.76	1	6.67	0	0.00	1	3.33
31-45	12	28.57	22	46.81	24	55.81	58	43.94	5	33.33	7	46.67	12	40.00
46-60	9	21.43	11	23.40	10	23.26	30	22.73	3	20.00	6	40.00	9	30.00
More than 60	7	16.67	2	4.26	1	2.33	10	7.58	6	40.00	2	13.33	8	26.67
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00
Average Age	41.79		36.68		39.14		39.11		54.80		48.80		51.80	
Youngest	21.00		21.00		18.00		18.00		21.00		37.00		21.00	
Oldest	77.00		66.00		69.00		77.00		80.00		72.00		80.00	
Educational Attainment														
Elementary														
Undergrad	7	16.67	7	14.89	8	18.60	22	16.67	2	13.33	0	0.00	2	6.67
Elementary Grad	7	16.67	7	14.89	2	4.65	16	12.12	3	20.00	0	0.00	3	10.00
High School														
Undergrad	4	9.52	7	14.89	10	23.26	21	15.91	1	6.67	1	6.67	2	6.67
High School Grad	15	35.71	19	40.43	19	44.19	53	40.15	5	33.33	7	46.67	12	40.00
College														
Undergrad	6	14.29	2	4.26	0	0.00	8	6.06	0	0.00	1	6.67	1	3.33
College Grad	3	7.14	5	10.64	4	9.30	12	9.09	4	26.67	6	40.00	10	33.33
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00
Distribution of Occupation														
Farmer/Fisherfolk	1	2.38	0	0.00	0	0.00	1	0.76	3	20.00	1	6.67	4	13.33
Public Official	0	0.00	2	4.26	1	2.33	3	2.27	0	0.00	3	20.00	3	10.00
Salary Worker	10	23.81	4	8.51	7	16.28	21	15.91	3	20.00	2	13.33	5	16.67
Daily Wage Worker	7	16.67	14	29.79	14	32.56	35	26.52	0	0.00	7	46.67	7	23.33
Private Businessman	11	26.19	15	31.91	10	23.26	36	27.27	6	40.00	1	6.67	7	23.33
Student	0	0.00	0	0.00	1	2.33	1	0.76	0	0.00	0	0.00	0	0.00
Pension Receiver	0	0.00	0	0.00	0	0.00	0	0.00	1	6.67	0	0.00	1	3.33
No Job (NJ)	13	30.95	12	25.53	10	23.26	35	26.52	2	13.33	1	6.67	3	10.00
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00

Source: JICA Study Team

In terms of occupation, majority of the respondents on Boracay Island and the Mainland of Malay were daily waged workers, 26% and 23% respectively. On Boracay Island, the majority of the respondents were working as employees of different business establishments on Boracay Island. On the Mainland of Malay, the majority were working as skilled laborers.

(3) Annual Income of Households

Table A.5.1-4 presents the annual income profile of the household respondents. Fifty-one percent (51%) of the respondents on the Boracay Island have an annual income range

between PhP100,000 to PhP300,000. The same result with the respondents on the Mainland of Malay, wherein 43% have an annual income between PhP100,000 to PhP300,000. A total of 15 respondents on the island have an income of more than PhP300,000 and four have an annual income of more than PhP600,000. This result is maybe due to the fact that there are more job opportunities on Boracay Island as compared to the Mainland of Malay. As per observation during the conduct of the survey, a large portion of local and foreign investors is present on Boracay Island. It means more job opportunities made available for local residents.

Table A.5.1-4. Distribution of Household Annual Income of Respondents.

Distribution of Annual Income (PhP)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland of Malay	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Less than 65,000	7	16.67	0	0.00	6	13.95	13	9.85	2	4.76	0	0.00	2	6.67
65,001 to 100,000	8	19.05	13	27.66	15	34.88	36	27.27	6	14.29	5	10.64	11	36.67
100,001 to 300,000	19	45.24	31	65.96	18	41.86	68	51.52	5	11.90	8	17.02	13	43.33
300,001 to 600,000	5	11.90	2	4.26	4	9.30	11	8.33	2	4.76	1	2.13	3	10.00
More than 600,000	3	7.14	1	2.13	0	0.00	4	3.03	0	0.00	1	2.13	1	3.33
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00
Ave. Income	214,571.00		177,656.00		131,853.00		174,481.01		142,168.00		177,011.00		155,569.15	
Lowest Income	48,000.00		68,400.00		36,000.00		36,000.00		48,000.00		66,528.00		48,000.00	
Highest Income	892,900.00		768,000.00		480,000.00		892,900.00		403,200.00		624,000.00		624,000.00	

Source: JICA Study Team

It can be observed that the average annual income on Boracay Island is higher compared to the Mainland of Malay. A total of PhP174,481 is the average annual income in the island as compared to PhP155,569 average annual income on the Mainland of Malay. The highest recorded household income on Boracay Island is PhP892,900 in Barangay Balabag that is the main barangay with the most number of commercial and business establishments. On the other hand, on the Mainland of Malay the highest recorded annual income is PhP624,000. Majority of the residents on the Mainland of Malay have a family member who work as overseas contract workers and provide regular remittances to their families left on the Mainland of Malay.

(4) House Type, House & Land Area and Ownership

Majority of the type of housing materials of the household respondents are made from light materials and semi-concrete made (Table A.5.1-5). A total of 46% of the respondents on Boracay Island have a house made from light-made materials such as *nipa* and *cogon*, and 37% of the respondents have semi-concrete made houses. Half of the respondents on the Mainland of Malay (50%) have houses made from semi-concrete combination of wood and concrete materials.

Table A.5.1-5 Type of Housing Materials and Ownership of the House and Lot

Item	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland of Malay	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Type of Housing Materials														
Light-made Materials	11	26.19	28	59.57	22	51.16	61	46.21	3	20.00	2	13.33	5	16.67
Hardwood-made	1	2.38	1	2.13	4	9.30	6	4.55	0	0.00	0	0.00	0	0.00
Semi-concrete Made	23	54.76	13	27.66	13	30.23	49	37.12	8	53.33	7	46.67	15	50.00
Concrete-made	7	16.67	5	10.64	4	9.30	16	12.12	4	26.67	6	40.00	10	33.33
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00
Land Ownership of the House														
Owned	29	69.05	22	46.81	24	55.81	75	56.82	14	93.33	14	93.33	28	93.33
Rented	9	21.43	12	25.53	4	9.30	25	18.94	0	0.00	0	0.00	0	0.00
Rent-free Occupant	4	9.52	13	27.66	15	34.88	32	24.24	1	6.67	1	6.67	2	6.67
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00
Ownership of the House														
Owned	33	78.57	42	89.36	31	72.09	106	80.30	13	86.67	12	80.00	25	83.33
Rented	8	19.05	2	4.26	0	0.00	10	7.58	2	13.33	1	6.67	3	10.00
Rent-free Occupant	1	2.38	3	6.38	12	27.91	16	12.12	0	0.00	2	13.33	2	6.67
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00

Source: JICA Study Team

Majority of the household respondents own the land, 57% on Boracay Island and 93% on the Mainland of Malay respectively. The same result can be observed with ownership of the houses, where 56% of the respondents on Boracay Island own the house as well as the 93% of the respondents on the Mainland of Malay.

The average area of the respondent houses was 20.40 square meters on Boracay Island and 31.23 square meters on the Mainland of Malay (Table A.5.1-6). In terms of surrounding yard or garden area the average size on Boracay Island is about 9.23 square meters as compared to the respondents on the Mainland of Malay having an average size of 16.49 square meters.

Table A.5.1-6 Area of House and Garden/Yard of Household Respondents

Area (sq. m.)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland of Malay	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
House														
1 to 10	3	7.14	9	19.15	7	16.28	19	14.39	0	0.00	2	13.33	2	6.67
11 to 20	30	71.43	26	55.32	22	51.16	78	59.09	5	33.33	4	26.67	9	30.00
21 to 30	4	9.52	4	8.51	9	20.93	17	12.88	6	40.00	2	13.33	8	26.67
31 to 40	1	2.38	2	4.26	4	9.30	7	5.30	1	6.67	0	0.00	1	3.33
More than 40	4	9.52	6	12.77	1	2.33	11	8.33	3	20.00	7	46.67	10	33.33
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00
Smallest	9.01		5.95		7.43		5.95		13.56		9.29		9.29	
Biggest	55.70		128.20		44.59		128.20		57.96		62.00		62.00	
Average	19.76		22.35		18.90		20.40		29.99		32.48		31.23	
Garden														
0	9	21.43	4	8.51	2	4.65	15	11.36	0	0.00	0	0.00	0	0.00
1 to 10	29	69.05	30	63.83	28	65.12	87	65.91	7	46.67	7	46.67	14	46.67
11 to 20	3	7.14	10	21.28	11	25.58	24	18.18	5	33.33	4	26.67	9	30.00
21 to 30	1	2.38	1	2.13	1	2.33	3	2.27	1	6.67	2	13.33	3	10.00
31 to 40	0	0.00	1	2.13	0	0.00	1	0.76	1	6.67	1	6.67	2	6.67
More than 40	0	0.00	1	2.13	1	2.33	2	1.52	1	6.67	1	6.67	2	6.67
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00
Smallest	0.00		0.00		0.00		0.00		6.00		6.32		6.00	
Biggest	23.22		89.09		55.06		89.09		44.59		69.67		69.67	
Average	6.30		11.05		10.10		9.23		15.28		17.70		16.49	

Source: JICA Study Team

(5) Household Sources of Information

In terms of different sources of information, the primary source was mass media specifically television and radio (Table A.5.1-7). On Boracay Island and the Mainland of Malay, 85 and 26 respondents respectively mentioned that the primary source of information is from television and radio. It is also noteworthy, that 44 respondents on Boracay Island and 13 respondents on the Mainland of Malay considered their neighbors as one of the primary sources of information. Other significant sources of information gathered during the survey are from government announcement (24 responses) and from newspapers and magazines with 22 responses.

Table A.5.1-7 Sources of Household Information

Item	Balabag	Manoc-Manoc	Yapak	Boracay Island	Balusbos	Poblacion	Mainland of Malay	Total
Television	32	30	23	85	13	13	26	111
Radio	33	22	30	85	9	10	19	104
Newspapers/Magazines	10	2	7	19	1	2	3	22
Pamphlets/Posters	3	11	2	16	0	2	2	18
Gov't Announcements	2	7	6	15	3	6	9	24
NGO's/CBO's	0	0	0	0	0	0	0	0
Neighbors	22	12	10	44	6	7	13	57
Total	102	84	78	264	32	40	72	336

Source: JICA Study Team

5.1.2 Awareness on Solid Waste and Environment

Table A.5.1-8 to Table A.5.1-9 present the environmental and solid waste concerns of the respondents. All of the respondents were asked for perceptions on the cleanliness of the house and surroundings, main problems on household and their different activities undertaken to maintain cleanliness.

(1) Perception on Cleanliness

Out of 132 household respondents on the Boracay Island 103 (78%) among them perceived their house and surroundings as clean and an additional 14% among the respondents stated that the cleanliness of their house and surroundings are enough to be proud of. The same results were observed in the two (2) barangay residents of the Mainland of Malay, 83% of the 30 respondents perceived their house as clean and an additional 10% had stated that they are proud of the cleanliness of their house and surroundings.

Table A.5.1-8 Perception on the Cleanliness of House/Surrounding

Item	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland of Malay	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
I don't think that it is so clean.	2	4.76	4	8.51	5	11.63	11	8.33	2	13.33	0	0.00	2	6.67
I think that it is clean but not enough to be proud of	35	83.33	32	68.09	36	83.72	103	78.03	12	80.00	13	86.67	25	83.33
I think that it is too clean to be proud of	5	11.90	11	23.40	2	4.65	18	13.64	1	6.67	2	13.33	3	10.00
I have no idea	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00

Source: JICA Study Team

(2) Clean Household Problems Regarding Solid Waste Management

Majority of the respondents on Boracay (42%) said that they do not know if they have household problems regarding cleanliness or pests infestation (Table A.5.1-9). This could be attributed due to the high cleanliness perception rate of their house and surroundings. In addition, 27% of the respondents have experienced problems on littering of waste. Several of the respondents have also stated that problem on indiscriminate throwing of trash in the waste collection points (16%) is present and there is illegal dumping of waste (10%).

On the Mainland of Malay, majority of the households (83%) stated that there is illegal dumping of waste anywhere in the area. This problem is followed by indiscriminate littering of waste (70%), scattering of trash in the different waste collection points (50%) and the burning of municipal waste (37%).

Table A.5.1-9 Household Problems Experienced by Respondents Regarding Cleanliness of Their Environment.

Item	Balabag	Manoc-Manoc	Yapak	Boracay Island	Balusbos	Poblacion	Mainland Malay	Total
Littering of wastes anywhere	7	5	24	36	11	10	21	57
Dumping of wastes anywhere	2	3	8	13	13	12	25	38
Scattering trash in waste collection points	13	3	5	21	8	7	15	36
Offensive odor from surrounding waste treatment	0	2	1	3	0	0	0	3
Insects, pests, worms or animals proliferate due to scattering solid waste	1	0	0	1	0	0	0	1
Burning of municipal waste	2	4	0	6	6	5	11	17
Others	5	3	1	9	2	1	3	12
I don't know	18	24	14	56	0	0	0	56
Total	48	44	53	145	40	35	75	220

Source: JICA Study Team

(3) Cleaning Activities

Majority of the households on Boracay Island and the Mainland of Malay practice regular cleaning activities in the house (90% each). In addition, 87% on Boracay Island and 57% of the respondents on the Mainland of Malay practice waste segregation. Also, 64% of the respondents on Boracay Island are discharging waste at the designated time and place of discharge making them highly aware of the policy and practice on solid waste management (Table A.5.1-10).

Table A.5.1-10 Cleaning Activities Undertaken by Households

Item	Balabag	Manoc-Manoc	Yapak	Boracay Island	Balusbos	Poblacion	Mainland Malay	Total
Clean around my house only	38	42	39	119	14	13	27	146
Practice waste segregation	35	42	38	115	8	9	17	132
Discharge waste at designated time/place	27	30	27	84	1	0	1	85
Participate in voluntary cleaning activities	3	2	2	7	1	0	1	8
Educate family to keep house and surrounding clean	5	0	3	8	0	0	0	8
Others	0	0	0	0	2	3	5	5
Total	108	116	109	333	26	25	51	384

Source: JICA Study Team

5.1.3 Knowledge on Solid Waste Management and 3R Activities (Reduce, Reuse, Recycle)

The survey for household respondents also validated the level of knowledge on SWM and the corresponding 3R activities being done by the respondents. The different activities being done by the respondents to adhere to SWM segregation were also identified during the survey.

(1) Awareness on Solid Waste Management Program

All of the households on Boracay Island are aware of the SWM ordinance in the municipality (Table A.5.1-11). Almost all of the respondents on the island are aware of the different policies guiding the SWM program. Activities such as solid waste collection schedule and waste discharging time and place are known, as well as the categories of segregation.

On the other hand, less than half (47%) of the respondents on the Mainland of Malay are aware of the SWM ordinance and policies. This is due to the fact that majority of the respondents on the Mainland of Malay (60%) have stated that there is no collection of solid wastes in their respective areas and barangays. This is the main reason why there is a low level of awareness on the Mainland of Malay in terms of SWM program implementation.

Table A.5.1-11 Level of Awareness on Solid Waste Management Ordinance/Polices.

Level of Awareness	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
SWM Ordinance																
Yes	42	100.00	46	97.87	43	100.00	131	99.24	6	40.00	8	53.33	14	46.67	145	89.51
No	0	0.00	0	0.00	0	0.00	0	0.00	6	40.00	3	20.00	9	30.00	9	5.56
No Idea	0	0.00	1	2.13	0	0.00	1	0.76	3	20.00	4	26.67	7	23.33	8	4.94
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Awareness on SWM Policies																
Day/Time of SW Collection	41	97.62	46	97.87	43	100.00	130	98.48	0	0.00	2	13.33	2	6.67	132	81.48
Time of Discharging SW	41	97.62	46	97.87	43	100.00	130	98.48	0	0.00	5	33.33	5	16.67	135	83.33
Place of Discharging SW	40	95.24	46	97.87	43	100.00	129	97.73	0	0.00	5	33.33	5	16.67	134	82.72
Category of Segregation	39	92.86	43	91.49	41	95.35	123	93.18	2	13.33	6	40.00	8	26.67	131	80.86
Others (No collection in the barangay)	1	2.38	2	4.26	0	0.00	3	2.27	13	86.67	5	33.33	18	60.00	21	12.96

Source: JICA Study Team

(2) Degree of Segregation

A total of 107 or 81% of the households on Boracay Island agreed that the food wastes and recyclables are important to segregate from other kind of waste. The main reason for this is because food wastes can be feed to livestock and household pets and the recyclables are being sold to junk shops for additional household income. There is an additional 19 respondents (14%) on the island had stated that recyclables should not be collected by the garbage truck in their area.

Eight (8) respondents on the Mainland of Malay agreed that recyclables should not be collected for these can be sold to junk shops. There were three (3) respondents on the Mainland of Malay who do not know the segregation categories of the municipality (Table A.5.1-12).

Table A.5.1-12 Degree of Segregation

Item	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
All wastes are mixed without segregation	1	2.38	0	0.00	0	0.00	1	0.76	0	0.00	0	0.00	0	0.00	1	0.62
Only recyclables are separated from other wastes	4	9.52	0	0.00	1	2.33	5	3.79	0	0.00	2	13.33	2	6.67	7	4.32
Only food waste and recyclables are separated from other wastes	34	80.95	35	74.47	38	88.37	107	81.06	0	0.00	0	0.00	0	0.00	107	66.05
Recyclables should not be collected but other wastes must be collected	3	7.14	12	25.53	4	9.30	19	14.39	1	6.67	7	46.67	8	26.67	27	16.67
I don't know how to segregate	0	0.00	0	0.00	0	0.00	0	0.00	3	20.00	0	0.00	3	10.00	3	1.85
Total	42	100	47	100	43	100	132	100	4	26.67	9	60	13	43.33	145	89.51

Source: JICA Study Team

(3) Source of Information on SWM

In terms of getting the information on practicing segregation and solid waste discharge, majority of the households on Boracay Island follow the instructions provided by the barangay monitoring team (98 responses) who regularly observe their waste discharging activities (Table A.5.1-13). The dissemination meeting of the different barangays on Boracay Island (72 responses) is also a significant source of information among the respondents. In addition, announcements and advertisements from the radio (48 responses) were cited as an information source (33 responses).

The household respondents on the Mainland of Malay also sourced their information on discharging methods through dissemination meeting by the barangay (9 responses), from television (9 responses) and from radio announcements (9 responses). It was also observed that a large portion of the respondents on the Mainland of Malay (7 responses) have no idea or not knowledgeable in the discharge methods of the SWM program.

Table A.5.1-13 Different Means in Getting Knowledge on Discharging Methods

Different Means	Balabag	Manoc-manoc	Yapak	Boracay Is.	Balusbos	Poblacion	Mainland Malay	Total
Poster in tricycles	0	5	0	5	0	0	0	5
Poster in multi-cab	0	0	0	0	0	0	0	0
Poster in pumpboat	0	0	0	0	0	0	0	0
Heard in the neighborhood	17	9	7	33	0	2	2	35
Dissemination meeting of municipality	1	1	0	2	0	1	1	3
Dissemination meeting of barangay	28	24	20	72	1	8	9	81
Dissemination meeting of NGO/CBO	0	0	0	0	0	0	0	0
Instruction from brgy monitoring team	19	41	38	98	0	0	0	98
Newspapers/Newsletters	4	1	5	10	0	0	0	10
Radio	29	7	12	48	1	6	7	55
TV	9	8	7	24	3	6	9	33
Internet	1	0	0	1	0	0	0	1
Others	2	1	1	4	0	0	0	4
I don't know the discharge method	0	0	0	0	6	1	7	7
Total	110	97	90	297	11	24	35	332

Source: JICA Study Team

5.1.4 Waste Discharge Activities

The public awareness survey also assessed the waste discharging activities of the different households. The study reviewed the different discharging activities of the household per type of waste in corresponding waste segregation categories of the municipality. The volume of discharge per respondent was estimated to provide a general solid waste discharge situation of the households on Boracay Island and the Mainland of Malay. The household capacity to discharge solid waste was also estimated.

(1) Handling Manner

1) Food Wastes and Recyclables

Based on the survey, majority of the households on Boracay Island and the Mainland of Malay are feeding their food wastes to their pets, 121 and 27 responses respectively (Table A.5.1-14). Newspapers, magazines and cartons were discharged with segregation (77 responses) and burned (76 responses) on Boracay Island. On the Mainland of Malay, majority of the newspaper and magazines were burned (21 responses) and six (6) among the respondents discharged these items without segregation. Glass bottles, cans and PET bottles are either being discharged with segregation or being sold to junkshops for additional household income of respondents on Boracay. On the Mainland of Malay, almost all of the glass bottles, cans and PET bottles were sold to junkshops.

Table A.5.1-14 Solid Waste Discharging Activities (Primary Waste Categories)

Item	Balabag	Manoc-Manoc	Yapak	Boracay Island	Balusbos	Poblacion	Mainland Malay	Total
Food Waste								
Bury	6	2	2	10	3	1	4	14
Burn	0	0	0	0	0	1	1	1
Feed to Pets	37	44	40	121	15	12	27	148
Make Compost	0	0	3	3	0	0	0	3
Sell to Buyers	1	0	0	1	0	0	0	1
Discharge w/Segregation	3	2	4	9	0	0	0	9
Discharge w/out Segregation	1	0	0	1	0	0	0	1
Total	48	48	49	145	18	14	32	177
Newspaper/Magazines/Cartons								
Bury	0	2	1	3	2	0	2	5
Burn	25	34	17	76	12	9	21	97
Sell to Buyers	3	6	2	11	0	2	2	13
Discharge w/Segregation	24	22	31	77	2	0	2	79
Discharge w/out Segregation	1	0	0	1	2	4	6	7
Total	53	64	51	168	18	15	33	201
Glass Bottles								
Bury	1	0	0	1	0	1	1	2
Burn	0	0	1	1	0	0	0	1
Sell to Buyers	32	44	37	113	15	14	29	142
Discharge w/Segregation	21	22	25	68	3	0	3	71
Discharge w/out Segregation	1	0	0	1	2	4	6	7
Total	55	66	63	184	20	19	39	223
Cans								
Bury	1	0	0	1	0	0	0	1
Sell to Buyers	31	43	37	111	15	15	30	141
Discharge w/Segregation	22	20	25	67	2	0	2	69
Discharge w/out Segregation	0	0	0	0	2	4	6	6
Total	54	63	62	179	19	19	38	217
PET Bottles								
Sell to Buyers	31	44	34	109	15	15	30	139
Discharge w/Segregation	20	20	25	65	2	0	2	67
Discharge w/out Segregation	0	0	0	0	2	4	6	6
Total	51	64	59	174	19	19	38	212

Source: JICA Study Team

2) Other Types of Waste

Table A.5.1-15 presents the discharging activities of the different households on other waste types, i.e. other plastics, hazardous wastes, construction waste and others. On Boracay Island, other types of plastic wastes were either discharged with segregation (83 responses) or sold to plastic buyers (25 responses) while on the Mainland of Malay, the majority of the plastic wastes are being sold to buyers (26 responses).

Construction waste was either sold to buyers or being discharged with segregation on Boracay Island while on the Mainland of Malay majority of the respondents burned this type

of waste. Hazardous waste on Boracay Island were either being buried (55 responses) or being discharged with segregation (89 responses). While the majority of the hazardous wastes on the Mainland of Malay are also being buried (28 responses).

Table A.5.1-15 Solid Waste Discharging Activities (Other Waste Categories)

Item	Balabag	Manoc-Manoc	Yapak	Boracay Island	Balusbos	Poblacion	Mainland Malay	Total
Other Plastics								
Bury	0	0	0	0	0	1	1	1
Burn	2	4	0	6	0	0	0	6
Sell to Buyers	18	6	1	25	14	12	26	51
Discharge w/Segregation	22	30	31	83	2	0	2	85
Discharge w/out Segregation	1	0	0	1	2	4	6	7
Total	43	40	32	115	18	17	35	150
Construction Waste								
Bury	2	3	1	6	0	0	0	6
Burn	7	9	13	29	3	4	7	36
Sell to Buyers	5	11	15	31	1	2	3	34
Discharge w/Segregation	6	15	13	34	1	0	1	35
Discharge w/out Segregation	0	0	0	0	1	3	4	4
Total	20	38	42	100	6	9	15	115
Hazardous Waste								
Bury	24	17	14	55	15	13	28	83
Burn	0	1	0	1	0	0	0	1
Sell to Buyers	1	3	0	4	0	0	0	4
Discharge w/Segregation	20	34	35	89	1	0	1	90
Discharge w/out Segregation	0	1	0	1	1	4	5	6
Total	45	56	49	150	17	17	34	184
Other Type of Wastes								
Bury	3	1	2	6	0	0	0	6
Burn	0	1	0	1	0	0	0	1
Make Compost	0	1	0	1	0	0	0	1
Discharge w/Segregation	4	10	13	27	0	0	0	27
Discharge w/out Segregation	2	1	0	3	3	3	6	9
Total	9	14	15	38	3	3	6	44

Source: JICA Study Team

Other type of waste, in this case are sanitary diapers that do not have a clear category. Majority of the respondents are having a hard time on how to dispose baby diapers wherein majority of them include the diapers by discharging them separately from the other wastes while some of the respondents bury the sanitary diapers instead.

(2) Frequency of Waste Discharge

Table A.5.1-16 to Table A.5.1-18 explains the frequency of waste discharge of the different household respondents of the survey. For food waste, almost all of the households (97%) discharge food waste seven times per week. Recyclable wastes are being discharged on the average at 2.79 times per week in the whole municipality in the Mainland of Malay (Table

A.5.1-17). On Boracay Island, households discharge recyclable wastes on the average 3.10 times per week and on the Mainland of Malay, it is 1.41 times per week (Table A.5.1-17).

In terms of residual wastes, the average discharge of households on Boracay Island is 3.12 times per week and higher on the Mainland of Malay at 4.37 times per week (Table A.5.1-18). The discharge frequency of 0.25 times per week and 0.5 times per week means that the household discharge either recyclable or residual wastes 1-2 times per month.

Table A.5.1-16 Frequency of Discharge of Food Waste

Discharge Frequency (times/week)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0	0.00	2	4.26	1	2.33	3	2.27	0	0.00	1	6.67	1	3.33	4	2.47
7	42	100.00	45	95.74	42	97.67	129	97.73	15	100.00	14	93.33	29	96.67	158	97.53
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Least Freq.	7.00		1.00		1.00		1.00		7.00		1.00		1.00		1.00	
Highest Freq.	7.00		7.00		7.00		7.00		7.00		7.00		7.00		7.00	
Ave. Freq.	7.00		6.74		6.86		6.86		7.00		6.60		6.80		6.85	

Source: JICA Study Team

Table A.5.1-17 Frequency of Discharge of Recyclable Waste

Discharge Frequency (times/week)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0.25	5	11.90	6	12.77	3	6.98	14	10.61	2	13.33	3	20.00	5	16.67	19	11.73
0.50	1	2.38	0	0.00	2	4.65	3	2.27	1	6.67	0	0.00	1	3.33	4	2.47
1	6	14.29	19	40.43	8	18.60	33	25.00	7	46.67	7	46.67	14	46.67	47	29.01
2	13	30.95	12	25.53	9	20.93	34	25.76	2	13.33	2	13.33	4	13.33	38	23.46
3	5	11.90	0	0.00	16	37.21	21	15.91	1	6.67	3	20.00	4	13.33	25	15.43
4	2	4.76	1	2.13	0	0.00	3	2.27	0	0.00	0	0.00	0	0.00	3	1.85
5	0	0.00	1	2.13	0	0.00	1	0.76	1	6.67	0	0.00	1	3.33	2	1.23
7	8	19.05	6	12.77	2	4.65	16	12.12	0	0.00	0	0.00	0	0.00	16	9.88
14	0	0.00	1	2.13	0	0.00	1	0.76	0	0.00	0	0.00	0	0.00	1	0.62
15	1	2.38	1	2.13	3	6.98	5	3.79	0	0.00	0	0.00	0	0.00	5	3.09
22	1	2.38	0	0.00	0	0.00	1	0.76	0	0.00	0	0.00	0	0.00	1	0.62
Total	42	100.00	47	100.00	43	100.00	132	100.00	14	93.33	15	100.00	29	96.67	161	99.38
Least Freq.	0.25		0.25		0.25		0.25		0.25		0.25		0.25		0.25	
Highest Freq.	22.00		15.00		15.00		22.00		5.00		3.00		5.00		22.00	
Ave. Freq.	3.57		2.65		3.13		3.10		1.43		1.38		1.41		2.79	

Source: JICA Study Team

Table A.5.1-18 Frequency of Discharge of Residual Waste

Discharge Frequency (times/week)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0.5	0	0.00	1	2.13	0	0.00	1	0.76	0	0.00	0	0.00	0	0.00	1	0.62
1	4	9.52	24	51.06	10	23.26	38	28.79	0	0.00	2	13.33	2	6.67	40	24.69
2	9	21.43	14	29.79	11	25.58	34	25.76	2	13.33	2	13.33	4	13.33	38	23.46
3	4	9.52	1	2.13	20	46.51	25	18.94	5	33.33	3	20.00	8	26.67	33	20.37
4	1	2.38	1	2.13	0	0.00	2	1.52	3	20.00	2	13.33	5	16.67	7	4.32
5	0	0.00	1	2.13	0	0.00	1	0.76	0	0.00	0	0.00	0	0.00	1	0.62
7	24	57.14	5	10.64	2	4.65	31	23.48	5	33.33	6	40.00	11	36.67	42	25.93
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Least Freq.	1.00		0.50		1.00		0.50		2.00		1.00		1.00		0.50	
Highest Freq.	7.00		7.00		7.00		7.00		7.00		7.00		7.00		7.00	
Ave. Freq.	4.90		2.12		2.47		3.12		4.40		4.33		4.37		3.35	

Source: JICA Study Team

(3) Volume of Waste Discharge

1) Number of Bags per Discharge

For food waste majority of the households discharge at an average of one bag per discharge both for Boracay Island (97%) and the Mainland of Malay (100%) as shown in Table A.5.1-19. For recyclable and residual wastes, the household respondents discharge about one 1-4 bags per discharge. For recyclable waste, the majority of the households in the Boracay Island discharge about one bag per discharge (72%). The same result can be observed in households on the Mainland of Malay that discharge one bag per discharge (70%). The same observation for residual wastes discharge, one bag per discharge is the major volume of respondents on Boracay Island and the Mainland of Malay.

Table A.5.1-19 Number of Bags Being Discharge by Waste Category

Item/ Frequency (bag/time)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Food Wastes																
1	40	95.24	46	97.87	43	100.00	129	97.73	15	100.00	15	100.00	30	100.00	159	98.15
2	2	4.76	1	2.13	0	0.00	3	2.27	0	0.00	0	0.00	0	0.00	3	1.85
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Recyclable Wastes																
1	30	71.43	37	78.72	28	65.12	95	71.97	10	66.67	11	73.33	21	70.00	116	71.60
2	10	23.81	8	17.02	10	23.26	28	21.21	3	20.00	4	26.67	7	23.33	35	21.60
3	2	4.76	2	4.26	4	9.30	8	6.06	1	6.67	0	0.00	1	3.33	9	5.56
4	0	0.00	0	0.00	1	2.33	1	0.76	0	0.00	0	0.00	0	0.00	1	0.62
Total	42	100.00	47	100.00	43	100.00	132	100.00	14	93.33	15	100.00	29	96.67	161	99.38
Residual Wastes																
1	32	76.19	36	76.60	33	76.74	101	76.52	12	80.00	10	66.67	22	73.33	123	75.93
2	8	19.05	7	14.89	6	13.95	21	15.91	2	13.33	4	26.67	6	20.00	27	16.67
3	2	4.76	3	6.38	3	6.98	8	6.06	1	6.67	1	6.67	2	6.67	10	6.17
4	0	0.00	1	2.13	1	2.33	2	1.52	0	0.00	0	0.00	0	0.00	2	1.23
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00

Source: JICA Study Team

2) Bag Size and Weight

Presented in Table A.5.1-20 to Table A.5.1-22 are the volume of discharge in terms of bag size and weight per bag. The size of waste or trash bag is classified into small, medium and large and the weight of bags depends on the type of waste. As observed during the survey, food wastes have the heaviest weight in any size of bags. The weight of a small size food waste bag is heavier than the weight of the recyclable wastes in small size bag.

Based on the Table A.5.1-20, majority of the food waste discharged is contained in small size trash bags (83%) with a range weight of 0.5 to 3.0 kg. During discharge majority of the households discharge an average of 1 kg of food waste in small trash bags. 14% of the households discharge medium size trash bags for food waste and 2% discharge large size trash bags.

For recyclable waste, 43% of the households use small size trash bags during discharge, 33% use medium size and 28% use large size trash bags. Among the respondents discharging small size trash bags, the majority of them discharge 0.5 kg of recyclable wastes. Among the medium size trash bags majority of the discharge is 1 kg of recyclables and among large size of trash bags 1.5 kg is the common weight discharged.

The same result can be observed for residual waste; 40% use small size trash bags, 34% use medium size and 33% use large size trash bags. Among the respondents discharging residual wastes, the major weight of discharge for small trash bag is 0.5 kg, for medium size trash bag is 1 kg and 1.5 kg for large trash bags.

Table A.5.1-20 Size and Weight of Bags Discharged for Food Waste

Size and Weight (kg)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Small																
0.50	0	0.00	5	11.63	1	3.23	6	5.50	2	14.29	0	0.00	2	7.69	8	5.93
1	35	100.00	38	88.37	30	96.77	103	94.50	11	78.57	12	100.00	23	88.46	126	93.33
3	0	0.00	0	0.00	0	0.00	0	0.00	1	7.14	0	0.00	1	3.85	1	0.74
Total	35	83.33	43	91.49	31	72.09	109	82.58	14	93.33	12	80.00	26	86.67	135	83.33
Medium																
1	0	0.00	1	33.33	0	0.00	1	5.26	0	0.00	2	66.67	2	50.00	3	13.04
1.5	0	0.00	0	0.00	3	30.00	3	15.79	1	100.00	0	0.00	1	25.00	4	17.39
2	6	100.00	2	66.67	7	70.00	15	78.95	0	0.00	1	33.33	1	25.00	16	69.57
Total	6	14.29	3	6.38	10	23.26	19	14.39	1	6.67	3	20.00	4	13.33	23	14.20
Large																
1	0	0.00	1	100.00	0	0.00	1	25.00	0	0.00	0	0.00	0	0.00	1	25.00
2	0	0.00	0	0.00	2	100.00	2	50.00	0	0.00	0	0.00	0	0.00	2	50.00
3	1	100.00	0	0.00	0	0.00	1	25.00	0	0.00	0	0.00	0	0.00	1	25.00
Total	1	2.38	1	2.13	2	4.65	4	3.03	0	0.00	0	0.00	0	0.00	4	2.47

Source: JICA Study Team

Table A.5.1-21 Size and Weight of Bags Discharged for Recyclable Waste

Size and Weight (kg)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Small																
0.50	22	100.00	19	100.00	14	93.33	55	98.21	5	100.00	8	100.00	13	100.00	68	98.55
1	0	0.00	0	0.00	1	6.67	1	1.79	0	0.00	0	0.00	0	0.00	1	1.45
Total	22	52.38	19	40.43	15	34.88	56	42.42	5	33.33	8	53.33	13	43.33	69	42.59
Medium																
0.50	1	8.33	0	0.00	0	0.00	1	2.70	2	25.00	0	0.00	2	11.76	3	5.56
1	11	91.67	8	100.00	16	94.12	35	94.59	5	62.50	9	100.00	14	82.35	49	90.74
2	0	0.00	0	0.00	1	5.88	1	2.70	0	0.00	0	0.00	0	0.00	1	1.85
7	0	0.00	0	0.00	0	0.00	0	0.00	1	12.50	0	0.00	1	5.88	1	1.85
Total	12	28.57	8	17.02	17	39.53	37	28.03	8	53.33	9	60.00	17	56.67	54	33.33
Large																
1	0	0.00	0	0.00	1	7.14	1	2.27	0	0.00	0	0.00	0	0.00	1	2.17
1.5	8	100.00	22	100.00	13	92.86	43	97.73	1	100.00	1	0.00	2	100.00	45	97.83
Total	8	19.05	22	46.81	14	32.56	44	33.33	1	6.67	1	6.67	2	6.67	46	28.40

Source: JICA Study Team

Table A.5.1-22 Size and Weight of Bags Discharged for Residual Waste

Size and Weight (kg)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Small																
0.50	20	100.00	16	100.00	11	100.00	47	100.00	6	66.67	9	100.00	15	83.33	62	95.38
1	0	0.00	0	0.00	0	0.00	0	0.00	2	22.22	0	0.00	2	11.11	2	3.08
3	0	0.00	0	0.00	0	0.00	0	0.00	1	11.11	0	0.00	1	5.56	1	1.54
Total	20	47.62	16	34.04	11	25.58	47	35.61	9	60.00	9	60.00	18	60.00	65	40.12
Medium																
0.5	1	7.14	0	0.00	0	0.00	1	2.70	3	50.00	0	0.00	3	23.08	4	7.27
1	13	92.86	14	100.00	14	100.00	41	110.81	2	33.33	7	100.00	9	69.23	50	90.91
7	0	0.00	0	0.00	0	0.00	0	0.00	1	16.67	0	0.00	1	7.69	1	1.82
Total	14	33.33	14	29.79	14	32.56	42	31.82	6	40.00	7	46.67	13	43.33	55	33.95
Large																
1	0	0.00	0	0.00	1	5.56	1	1.96	1	50.00	0	0.00	1	50.00	2	3.77
1.5	9	100.00	24	100.00	17	94.44	50	98.04	1	50.00	0	0.00	1	50.00	51	96.23
Total	9	21.43	24	51.06	18	41.86	51	38.64	2	13.33	0	0.00	2	6.67	53	32.72

Source: JICA Study Team

(4) Price of Plastic Trash Bags

All of the household respondents are not spending or buying trash bags because they deem it as additional expense. All of the household respondents were re-using plastic sand bags from the market or grocery shops and stores.

(5) Household Capacity to Discharge Waste

The succeeding tables present the capacity of households in terms of the number of days the different wastes can be stored, the maximum distance traveled for waste discharge and willingness to purchase plastic trash bags.

(6) Number of Days to Discharge

Based on 23, the maximum number of days during which the households can store food waste on the average is one day. Majority of the respondents readily feed food waste to pets, thus there is no need to keep food wastes for longer periods of time. Recyclable waste on the other hand, can be stored for as short as one day to as long as 60 days. On the average, households are willing to keep recyclable wastes for eight days before discharge. These results were observed mainly because the different members of the household were collecting and keeping recyclables until they have collected enough to sell it directly to junk buyers in order for them to gain additional family income.

The household respondents are also willing to keep residual wastes but for a shorter number of days. Respondents on Boracay Island stated that they are willing to keep residual wastes for three days on the average as compared to respondents on the Mainland of Malay that is willing to keep residual wastes for two (2) days on the average.

Table A.5.1-23 Storage Capability (Number of Days) for Food Waste

Num of Days	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0	2	4.76	1	2.13	0	0.00	3	2.27	2	13.33	2	13.33	4	13.33	7	4.32
1	39	92.86	46	97.87	43	100.00	128	96.97	13	86.67	13	86.67	26	86.67	154	95.06
5	1	2.38	0	0.00	0	0.00	1	0.76	0	0.00	0	0.00	0	0.00	1	0.62
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Average	1.05		0.98		1.00		1.01		1.00		1.00		1.00		1.01	

Source: JICA Study Team

Table A.5.1-24 Storage Capability (Number of Days) for Recyclables

Num of Days	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	8	19.05	6	12.77	2	4.65	16	12.12	0	0.00	2	13.33	2	6.67	18	11.11
2	1	2.38	2	4.26	8	18.60	11	8.33	0	0.00	1	6.67	1	3.33	12	7.41
3	6	14.29	4	8.51	8	18.60	18	13.64	3	20.00	1	6.67	4	13.33	22	13.58
4	4	9.52	0	0.00	7	16.28	11	8.33	0	0.00	2	13.33	2	6.67	13	8.02
5	10	23.81	8	17.02	1	2.33	19	14.39	4	26.67	1	6.67	5	16.67	24	14.81
6	4	9.52	12	25.53	3	6.98	19	14.39	2	13.33	2	13.33	4	13.33	23	14.20
7	2	4.76	6	12.77	5	11.63	13	9.85	3	20.00	3	20.00	6	20.00	19	11.73
14	0	0.00	1	2.13	0	0.00	1	0.76	0	0.00	0	0.00	0	0.00	1	0.62
15	3	7.14	2	4.26	5	11.63	10	7.58	1	6.67	0	0.00	1	3.33	11	6.79
21	0	0.00	0	0.00	1	2.33	1	0.76	0	0.00	0	0.00	0	0.00	1	0.62
30	3	7.14	6	12.77	3	6.98	12	9.09	1	6.67	3	20.00	4	13.33	16	9.88
60	1	2.38	0	0.00	0	0.00	1	0.76	0	0.00	0	0.00	0	0.00	1	0.62
Total	42	100.00	47	100.00	43	100.00	132	100.00	14	93.33	15	100.00	29	96.67	161	99.38
Average	7.79		8.51		7.30		7.89		8.23		11.00		9.62		8.21	

Source: JICA Study Team

Table A.5.1-25 Storage Capability (Number of Days) for Residuals

Num of Days	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	23	54.76	5	10.64	1	2.33	29	21.97	5	33.33	3	20.00	8	26.67	37	22.84
2	5	11.90	4	8.51	15	34.88	24	18.18	8	53.33	7	46.67	15	50.00	39	24.07
3	7	16.67	6	12.77	11	25.58	24	18.18	1	6.67	2	13.33	3	10.00	27	16.67
4	1	2.38	0	0.00	6	13.95	7	5.30	0	0.00	1	6.67	1	3.33	8	4.94
5	2	4.76	8	17.02	1	2.33	11	8.33	0	0.00	0	0.00	0	0.00	11	6.79
6	4	9.52	14	29.79	7	16.28	25	18.94	0	0.00	0	0.00	0	0.00	25	15.43
7	0	0.00	8	17.02	2	4.65	10	7.58	0	0.00	1	6.67	1	3.33	11	6.79
14	0	0.00	2	4.26	0	0.00	2	1.52	0	0.00	0	0.00	0	0.00	2	1.23
Total	42	100.00	47	100.00	43	100.00	132	100.00	14	93.33	14	93.33	28	93.33	160	98.77
Average	2.19		5.09		3.47		3.64		1.85		2.62		2.23		3.38	

Source: JICA Study Team

(7) Average Distance to Discharge Waste

Table A.5.1-26 to Table A.5.1-28 present the allowable distance the households from the waste collection points to discharge waste. The average distance is 21.7 m away from the house of the respondents. Majority of the respondents (54%) have stated that they are willing to bring food wastes 1-10 m away from the house for discharge. The average distance for recyclable and residual wastes is 21 m and 20 m respectively.

Table A.5.1-26. Distance to Discharge for Food Waste

Distance (meters)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0	12	28.57	3	6.38	2	4.65	17	12.88	1	6.67	1	6.67	2	6.67	19	11.73
1 to 10	25	59.52	31	65.96	16	37.21	72	54.55	8	53.33	8	53.33	16	53.33	88	54.32
11 to 20	3	7.14	4	8.51	7	16.28	14	10.61	4	26.67	5	33.33	9	30.00	23	14.20
21 to 30	1	2.38	0	0.00	4	9.30	5	3.79	2	13.33	1	6.67	3	10.00	8	4.94
31 to 40	0	0.00	1	2.13	0	0.00	1	0.76	0	0.00	0	0.00	0	0.00	1	0.62
41 to 50	1	2.38	3	6.38	5	11.63	9	6.82	0	0.00	0	0.00	0	0.00	9	5.56
51 to 60	0	0.00	0	0.00	2	4.65	2	1.52	0	0.00	0	0.00	0	0.00	2	1.23
More than 60	0	0.00	5	10.64	7	16.28	12	9.09	0	0.00	0	0.00	0	0.00	12	7.41
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Shortest	0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Farthest	50.00		300.00		250.00		300.00		30.00		30.00		30.00		300.00	
Average	6.21		24.83		40.33		23.95		12.00		11.53		11.77		21.70	

Source: JICA Study Team

Table A.5.1-27 Distance to Discharge Waste for Recyclable Waste

Distance (meters)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0	6	14.29	5	10.64	7	16.28	18	13.64	2	13.33	1	6.67	3	10.00	21	12.96
1 to 10	23	54.76	21	44.68	20	46.51	64	48.48	8	53.33	8	53.33	16	53.33	80	49.38
11 to 20	4	9.52	5	10.64	5	11.63	14	10.61	4	26.67	3	20.00	7	23.33	21	12.96
21 to 30	4	9.52	2	4.26	2	4.65	8	6.06	0	0.00	3	20.00	3	10.00	11	6.79
31 to 40	0	0.00	1	2.13	1	2.33	2	1.52	1	6.67	0	0.00	1	3.33	3	1.85
41 to 50	3	7.14	2	4.26	4	9.30	9	6.82	0	0.00	0	0.00	0	0.00	9	5.56
51 to 60	2	4.76	0	0.00	2	4.65	4	3.03	0	0.00	0	0.00	0	0.00	4	2.47
More than 60	0	0.00	11	23.40	2	4.65	13	9.85	0	0.00	0	0.00	0	0.00	13	8.02
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Shortest	0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Farthest	60.00		100.00		200.00		200.00		40.00		30.00		40.00		200.00	
Average	13.26		31.47		24.02		23.25		10.27		12.40		11.33		21.04	

Source: JICA Study Team

Table A.5.1-28 Distance to Discharge Waste for Residual Waste

Distance (meters)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0	9	21.43	8	17.02	4	9.30	21	15.91	3	20.00	0	0.00	3	10.00	24	14.81
1 to 10	22	52.38	20	42.55	24	55.81	66	50.00	7	46.67	8	53.33	15	50.00	81	50.00
11 to 20	3	7.14	4	8.51	5	11.63	12	9.09	3	20.00	4	26.67	7	23.33	19	11.73
21 to 30	4	9.52	1	2.13	2	4.65	7	5.30	1	6.67	3	20.00	4	13.33	11	6.79
31 to 40	0	0.00	1	2.13	1	2.33	2	1.52	1	6.67	0	0.00	1	3.33	3	1.85
41 to 50	3	7.14	2	4.26	3	6.98	8	6.06	0	0.00	0	0.00	0	0.00	8	4.94
51 to 60	1	2.38	0	0.00	2	4.65	3	2.27	0	0.00	0	0.00	0	0.00	3	1.85
More than 60	0	0.00	11	23.40	2	4.65	13	9.85	0	0.00	0	0.00	0	0.00	13	8.02
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Shortest	0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Farthest	60.00		100.00		200.00		200.00		40.00		30.00		40.00		40.00	
Average	11.79		30.23		23.37		22.13		11.27		14.27		12.77		20.40	

Source: JICA Study Team

(8) Willingness to Buy Trash Bags

Based on Table A.5.1-29, almost all of the respondents (97%) are not willing to buy trash bags to properly segregate and discharge waste. The main reason for this is that there are plastic bags which can be reused as trash bags for waste discharge. Furthermore, purchase of plastic trash bags is an additional family expense for them. Although, there were 4 respondents who are willing to buy trash bags, the suggested selling price for the bags range from PhP1 to PhP30 per month.

Table A.5.1-29 Willingness to Buy Trash Bags for Discharging Waste

Item	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Willingness to Buy Trash Bags																
Not Willing	39	92.86	46	97.87	43	100.00	128	96.97	15	100.00	15	100.00	30	100.00	158	97.53
Willing	3	7.14	1	2.13	0	0.00	4	3.03	0	0.00	0	0.00	0	0.00	4	2.47
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Amount (PhP/month)																
1.00	0	0.00	1	100.00	0	0.00	1	25.00	0	0.00	0	0.00	0	0.00	1	0.62
5.00	1	33.33	0	0.00	0	0.00	1	25.00	0	0.00	0	0.00	0	0.00	1	0.62
20.00	1	33.33	0	0.00	0	0.00	1	25.00	0	0.00	0	0.00	0	0.00	1	0.62
30.00	1	33.33	0	0.00	0	0.00	1	25.00	0	0.00	0	0.00	0	0.00	1	0.62

Source: JICA Study Team

(9) Implementation of 3R Activities

Presented in Table A.5.1-30 are the different 3R activities being practiced by households on the Mainland of Malay. The most popular 3R activity being practiced is using kitchen waste to feed animals. Majority of the respondents (96%) are doing this type of 3R activity all the time. Segregating the recyclables to sell to buyers is also very popular among the households. Majority (68%) of the respondents are always doing this activity. Households

are also significantly undertaking reduction of kitchen waste during the cooking process and also fixing and repairing broken things. The other 3R activities that are not popular with the household respondents are to bring own shopping bag and making compost from kitchen waste. In general, all of the household covered in the survey are significantly undertaking 3R activities especially on Boracay Island.

Table A.5.1-30 3R Activities of the Households

3R Activity	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Reduce Kitchen Wastes in Cooking Process																
Do It At All	19	45.24	15	31.91	12	27.91	46	34.85	5	33.33	5	33.33	10	33.33	56	34.57
Sometimes Do It	17	40.48	28	59.57	27	62.79	72	54.55	5	33.33	4	26.67	9	30.00	81	50.00
Often Do It	1	2.38	3	6.38	3	6.98	7	5.30	4	26.67	4	26.67	8	26.67	15	9.26
Do It Every time	5	11.90	1	2.13	1	2.33	7	5.30	1	6.67	2	13.33	3	10.00	10	6.17
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Repair and Reuse of Broken Things																
Don't Do It At All	20	47.62	16	34.04	14	32.56	50	37.88	4	26.67	0	0.00	4	13.33	54	33.33
Sometimes Do It	14	33.33	20	42.55	17	39.53	51	38.64	4	26.67	7	46.67	11	36.67	62	38.27
Often Do It	4	9.52	3	6.38	12	27.91	19	14.39	7	46.67	8	53.33	15	50.00	34	20.99
Do It Every time	4	9.52	8	17.02	0	0.00	12	9.09	0	0.00	0	0.00	0	0.00	12	7.41
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Bringing Own Shopping Bag																
Don't Do It At All	0	0.00	2	4.26	0	0.00	2	1.52	4	26.67	3	20.00	7	23.33	9	5.56
Sometimes Do It	4	9.52	1	2.13	0	0.00	5	3.79	0	0.00	2	13.33	2	6.67	7	4.32
Often Do It	11	26.19	14	29.79	14	32.56	39	29.55	2	13.33	0	0.00	2	6.67	41	25.31
Do It Every time	27	64.29	30	63.83	29	67.44	86	65.15	9	60.00	10	66.67	19	63.33	105	64.81
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Using Kitchen Waste to Feed Animals																
Don't Do It At All	32	76.19	38	80.85	34	79.07	104	78.79	10	66.67	9	60.00	19	63.33	123	75.93
Sometimes Do It	4	9.52	4	8.51	5	11.63	13	9.85	1	6.67	5	33.33	6	20.00	19	11.73
Often Do It	4	9.52	2	4.26	4	9.30	10	7.58	4	26.67	1	6.67	5	16.67	15	9.26
Do It Every time	2	4.76	3	6.38	0	0.00	5	3.79	0	0.00	0	0.00	0	0.00	5	3.09
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Using Kitchen Waste to Make Compost																
Don't Do It At All	2	4.76	2	4.26	1	2.33	5	3.79	0	0.00	1	6.67	1	3.33	6	3.70
Sometimes Do It	10	23.81	13	27.66	9	20.93	32	24.24	3	20.00	7	46.67	10	33.33	42	25.93
Often Do It	0	0.00	19	40.43	15	34.88	34	25.76	3	20.00	2	13.33	5	16.67	39	24.07
Do It Every time	30	71.43	13	27.66	18	41.86	61	46.21	9	60.00	5	33.33	14	46.67	75	46.30
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00
Segregate Recyclables & Sell to Buyers																
Don't Do It At All	26	61.90	40	85.11	31	72.09	97	73.48	5	33.33	9	60.00	14	46.67	111	68.52
Sometimes Do It	8	19.05	4	8.51	6	13.95	18	13.64	3	20.00	1	6.67	4	13.33	22	13.58
Often Do It	6	14.29	1	2.13	4	9.30	11	8.33	7	46.67	4	26.67	11	36.67	22	13.58
Do It Every time	2	4.76	2	4.26	2	4.65	6	4.55	0	0.00	1	6.67	1	3.33	7	4.32
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	100.00	15	100.00	30	100.00	162	100.00

Source: JICA Study Team

5.1.5 Opinion of Current Public Collection Service

The survey also evaluated the opinion of the different household respondents on the service of the current public collection activities. The level of satisfaction from the public collection service was asked to the respondents in order to have a gauge on the effective implementation of the current SWM program. This section only considered the household respondents on Boracay Island for the program have focused its activities on the island. This is true enough because all of the household respondents in the two barangays on the Mainland of Malay (Brangay Poblacion and Balusbos) were unsatisfied with the current public collection service for there is no public collection of wastes on the Mainland of Malay.

(1) Level of Satisfaction.

Based on Table A.5.1-31, majority of the respondents on Boracay Island were satisfied with the current public collection service. Majority of the households (48%) were very satisfied with the collection service. A small proportion (5%) was not satisfied of the service and two respondents who cannot provide opinions on the public collection service. The reason for satisfaction was also asked from the respondents. Majority of the satisfied respondents said that the collection time of waste is always on schedule (90 responses). Thirty-four (34) of the respondents are actively doing segregation in their household and the collection frequency is fairly often (27 responses). However, among those respondents who were not quite satisfied with the public collection service there are other major reasons on why they are unsatisfied (5 responses). Among their reasons are the very seldom collection or no collection of wastes at all in their respective area. In addition, there are also other kinds of wastes that are not being collected by the waste collection vehicle, such as sanitary napkins and infant diapers.

Table A.5.1-31 Level of Satisfaction and Reasons for Satisfaction/ Dissatisfaction in the Public Waste Collection Service (Boracay Island)

Item	Balabag		Manoc-Manoc		Yapak		Boracay Island	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Level of Satisfaction w/Current Public Collection Service								
Very Satisfied	20	47.62	18	38.30	26	60.47	64	48.48
A Little Satisfied	20	47.62	22	46.81	17	39.53	59	44.70
Not Satisfied at All	2	4.76	5	10.64	0	0.00	7	5.30
No Opinion	0	0.00	2	4.26	0	0.00	2	1.52
Total	42	100.00	47	100.00	43	100.00	132	100.00
Aspect of Service Being Satisfied								
Collection time is on schedule	29		29		32		90	
Collection frequency is often	15		6		6		27	
Segregation at our house is actively done	11		10		13		34	
It is easy to understand what item should be separated	5		1		3		9	
Total	60		46		54		160	
Aspect of Service Being Not Satisfied								
Collection frequency is few	0		2		0		2	
Segregation at our house is an additional burden and laborious	1		0		0		1	
Instruction for source separation is very strict	1		0		0		1	
Others	2		3		0		5	
Total	4		5		0		9	

Source: JICA Study Team

(2) Opinion on Current Public Collection Service

The household respondents were asked on their opinion on the different public collection services, i.e. time of discharge, collection frequency for food waste, recyclable and residual waste and the number of waste categories (Table A.5.1-32). Majority of the respondents stated to keep the current practice as it is. In terms of time of discharge, 93% of the respondents answered that the current schedule should be maintained. The same with the collection frequency of the different wastes categories that for them it is alright to maintain the current schedule.

Table A.5.1-32 Opinion on the Current Public Collection Service

Item	Balabag		Manoc-Manoc		Yapak		Boracay Island	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Time of Discharge Waste								
Keep it as is	40	95.24	41	87.23	42	97.67	123	93.18
Change schedule to:	1	2.38	3	6.38	1	2.33	5	3.79
5:00 AM	0		1		0		1	
6:00 AM	0		1		0		1	
7:00 AM	1		0		1		2	
9:00 AM	0		1		0		1	
Total	41	97.62	44	93.62	43	91.49	128	96.97
Food Waste Collection Frequency								
Keep it as is	41	97.62	44	93.62	43	100.00	128	96.97
Increase Collection	0	0.00	0	0.00	0	0.00	0	0.00
Reduce Collection	0	0.00	0	0.00	0	0.00	0	0.00
Total	41	97.62	44	93.62	43	91.49	128	96.97
Recyclables Collection Frequency								
Keep it as is	41	97.62	44	93.62	42	97.67	127	96.21
Increase Collection	0	0.00	0	0.00	0	0.00	0	0.00
Reduce Collection to 1X	0	0.00	0	0.00	1	2.33	1	0.76
Total	41	97.62	44	93.62	43	91.49	128	96.97
Residual Waste Collection Frequency								
Keep it as is	40	95.24	39	82.98	38	88.37	117	88.64
Increase Collection	1	2.38	5	10.64	4	9.30	10	7.58
Reduce Collection	0	0.00		0.00	1	2.33	1	0.76
Total	41	97.62	44	93.62	43	91.49	128	96.97
Number of Source Separation Categories								
Keep it as is	40	95.24	44	93.62	43	100.00	127	96.21
Reduce to 2 Categories	1	2.38	0	0.00	0	0.00	1	0.76
Increase Categories	0	0.00	0	0.00	0	0.00	0	0.00
Total	41	97.62	44	93.62	43	91.49	128	96.97

Source: JICA Study Team

5.1.6 Willingness to Pay for Waste Collection

One of the purposes of this public awareness survey is to determine the willingness to pay for waste collection. All of the household respondents were asked on whether they will be willing to pay a monthly collection fee for the segregated waste to facilitate the proper implementation of the SWM program in their respective barangays.

(1) Willingness to Pay.

Only 34% (55 respondents) are willing to have a monthly garbage collection fee in the MOM (Table A.5.1-332). From the 132 respondents on Boracay Island, households in Barangay Yapak are the most willing to participate in the collection fee (39%). Only a total of 43 respondents (33%) on Boracay and 12 respondents on the Mainland of Malay are willing to adopt a garbage collection fee. Among those who were willing to pay a garbage collection fee, 42% of the respondents suggested a fee of Php50.00 per month. This coincides with the

computed average amount of PhP48.28 per month. The lowest suggested amount is PhP5.00 and the highest is PhP500.00 per month.

Table A.5.1-33 Willingness to Pay Waste Collection Fee and Amount

Willingness and Amount (PhP/month)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland of Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Willingness to Pay Waste Collection Fee																
Yes	15	35.71	11	23.40	17	39.53	43	32.58	7	16.67	5	10.64	12	40.00	55	33.95
No	27	64.29	36	76.60	26	60.47	89	67.42	8	19.05	10	21.28	18	60.00	107	66.05
Total	42	100.00	47	100.00	43	100.00	132	100.00	15	35.71	15	31.91	30	100.00	162	100.00
Suggested Amount for Waste Collection Fee																
5.00	1	6.67	1	9.09	2	11.76	4	9.30	0	0.00	0	0.00	0	0.00	4	7.41
10.00	0	0.00	1	9.09	1	5.88	2	4.65	0	0.00	1	20.00	1	9.09	3	5.56
20.00	2	13.33	1	9.09	0	0.00	3	6.98	0	0.00	0	0.00	0	0.00	3	5.56
25.00	1	6.67	1	9.09	2	11.76	4	9.30	0	0.00	0	0.00	0	0.00	4	7.41
30.00	3	20.00	2	18.18	5	29.41	10	23.26	1	16.67	1	20.00	2	18.18	12	22.22
40.00	0	0.00	0	0.00	0	0.00	0	0.00	1	16.67	0	0.00	1	9.09	1	1.85
50.00	8	53.33	4	36.36	5	29.41	17	39.53	4	66.67	2	40.00	6	54.55	23	42.59
100.00	0	0.00	0	0.00	1	5.88	1	2.33	0	0.00	1	20.00	1	9.09	2	3.70
200.00	0	0.00	1	9.09	0	0.00	1	2.33	0	0.00	0	0.00	0	0.00	1	1.85
500.00	0	0.00	1	9.09	0	0.00	1	2.33	0	0.00	0	0.00	0	0.00	1	1.85
Total	15	100.00	12	100.00	16	100.00	43	100.00	6	100.00	5	100.00	11	100.00	54	100.00
Average Amount	37.33		85.00		35.63		48.85		45.00		48.00		46.25		48.28	
Lowest Amount	5.00		5.00		5.00		5.00		30.00		10.00		10.00		5.00	
Highest Amount	50.00		500.00		100.00		500.00		50.00		100.00		100.00		500.00	

Source: JICA Study Team

(2) Unwillingness to Pay

Majority of the household respondents (66%) are not willing to have a monthly garbage collection fee. As can be observed from Table A.5.1-34, the major reason for unwillingness to pay is that the respondents consider the garbage collection service is one of the main responsibilities of the municipality (32 responses). Other major reasons identified by the respondents are that they cannot afford to have an additional monthly payment (19 responses) and four (4) of the respondents have stated that the tourists and local business sector have more capacity to pay the garbage collection fee.

Table A.5.1-34 Reasons for Not Willing to Pay Garbage Collection Fee

Item	Balabag	Manoc-Manoc	Yapak	Boracay Island	Balusbos	Poblacion	Mainland of Malay	Total
Reasons for Not Willing to Pay								
Cannot afford the payment	2	12	4	18	1	0	1	19
Municipality is responsible for public service	6	16	5	27	5	0	5	32
Business/ Tourists more responsible to pay	3	1	0	4	0	0	0	4
Current waste collection service is not so good	0	1	0	1	0	0	0	1
Others	1	3	5	9	0	0	0	9
Total	12	33	14	59	6	0	6	65

Source: JICA Study Team

For an improvement in the public collection service the respondents who were willing to pay garbage collection fee were asked how much additional fee they are willing to pay. Majority of the response was still PhP50.00 per month representing additional fee for an improved collection services. Two (2) respondents are willing to add a minimum amount of PhP5.00 per month and one of the respondents in Barangay Manoc-manoc is willing to pay a monthly rate of PhP500.00. The average amount the respondents are willing to pay is PhP54.25.

Table A.5.1-35 Amount Willing to Pay for Improved Public Collection Service

Amount (PhP/ month)	Balabag		Manoc-Manoc		Yapak		Boracay Island		Balusbos		Poblacion		Mainland of Malay		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
5.00	0	0.00	1	10.00	1	5.88	2	5.41	0	0.00	0	0.00	0	0.00	2	4.44
10.00	0	0.00	0	0.00	2	11.76	2	5.41	0	0.00	0	0.00	0	0.00	2	4.44
15.00	1	6.67	0	0.00	0	0.00	1	2.70	0	0.00	0	0.00	0	0.00	1	2.22
20.00	0	0.00	1	10.00	0	0.00	1	2.70	0	0.00	0	0.00	0	0.00	1	2.22
25.00	0	0.00	1	10.00	0	0.00	1	2.70	0	0.00	0	0.00	0	0.00	1	2.22
30.00	0	0.00	1	10.00	4	23.53	5	13.51	0	0.00	0	0.00	0	0.00	5	11.11
35.00	0	0.00	0	0.00	1	5.88	1	2.70	0	0.00	0	0.00	0	0.00	1	2.22
40.00	0	0.00	0	0.00	0	0.00	0	0.00	1	16.67	0	0.00	1	12.50	1	2.22
50.00	10	66.67	4	40.00	3	17.65	17	45.95	3	50.00	2	100.00	5	62.50	22	48.89
55.00	1	6.67	0	0.00	0	0.00	1	2.70	1	16.67	0	0.00	1	12.50	2	4.44
60.00	0	0.00	1	10.00	0	0.00	1	2.70	1	16.67	0	0.00	1	12.50	2	4.44
75.00	1	6.67	0	0.00	0	0.00	1	2.70	0	0.00	0	0.00	0	0.00	1	2.22
100.00	2	13.33	0	0.00	1	5.88	3	8.11	0	0.00	0	0.00	0	0.00	3	6.67
500.00	0	0.00	1	10.00	0	0.00	1	2.70	0	0.00	0	0.00	0	0.00	1	2.22
Total	15	100.00	10	100.00	12	100.00	37	100.00	6	100.00	2	100.00	8	100.00	45	100.00
Average	56.33		84.00		35.83		55.30		50.83		50.00		50.48		54.25	
Lowest	15.00		5.00		5.00		5.00		40.00		50.00		40.00		5.00	
Highest	100.00		500.00		100.00		500.00		60.00		50.00		60.00		500.00	

Source: JICA Study Team

(3) Honest Opinion of Households Related to Waste Management

Table A.5.1-36 provides the honest opinions of the household respondents regarding implementation of the solid waste program in the municipality of Malay. Majority of the opinion of respondents is the need to improve the public collection services in the municipality (44 responses). This suggestion was primarily identified because there are many areas in the Boracay Island where residents are having problems on the waste collection. Some of the households are also far from the waste collection points and suggest an increase and improvement of the number of collections points to accommodate residents coming from far areas.

There are around 31 respondents who are satisfied with the solid waste program implementation in their area. However, there is still a need to increase the level of awareness of the whole municipality in solid waste management implementation (25 responses) and there should be a regular monitoring to be done as compliance to solid waste management.

Majority of the household respondents (24 responses) on the Mainland of Malay are experiencing no collection of solid waste and the active waste management activities on

Boracay Island are hardly felt on the Mainland of Malay. The local government should look and consider this problem in the improvement of the solid waste management program on the Mainland of Malay.

Table A.5.1-36 Honest Opinion Regarding Solid Waste Management Implementation on the Mainland of Malay

Honest Opinion on Solid Waste Managment	Freq.
Increase/Improve trash bins around the island	2
Increase awareness on SWM	25
Regular clean-up at the beach	3
Regular monitoring for compliance on SWM	18
I see no problems/SWM is properly implemented	31
Observe proper disposal of solid wastes	5
Hire people to maintain cleanliness at the island	1
All should participate in clean-up activities	2
Environment should be protected as a whole	6
Business establishment should also be responsible in maintaining cleanliness	2
There is no waste collection here in the area/barangay	24
Increase in the number and frequency of collection	13
Improve collection services	44
Improve and developed the MRF in the barangay	4
It is the responsibility of the municipal office to collect waste	5
No idea	20
Total	205

Source: JICA Study Team

5.2 Business Establishment Survey

5.2.1 General Information

(1) Selection of Targeted Establishments

Based on the list of registered business establishments, as provided by the Malay Municipal office, the survey was able to identify the different business types as main respondents during the survey. Table A.5.2-1 presents the different business types covered during the business establishment survey and the number of establishments covered per type and proportion to the overall surveyed sample. Majority of the respondents were Boracay Muslim Vendors (13%) and hotels/resorts and cottages with 12 establishments covered (12%). A number of other type of business were also surveyed, i.e. gasoline station, wholesalers, plastic ware vendors, appliance store, etc. The total of 101 business establishments was covered during the survey where 80 businesses are on Boracay Island and 21 on Mainland of Malay.

Table A.5.2-1 Distribution of Respondents According to Type of Business on the Mainland of Malay and Boracay Island

Type of Business Establishment	Boracay Island		Mainland of Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Boracay Muslim Vendors	13	16.25	0	0.00	13	12.87
Hotels/Resorts/Cottages	12	15.00	0	0.00	12	11.88
Boutiques/Souvenir Shops	8	10.00	0	0.00	8	7.92
Boracay Vendors	8	10.00	0	0.00	8	7.92
Bars/Restaurants	7	8.75	0	0.00	7	6.93
BIHA	5	6.25	2	9.53	7	6.93
Sari-sari Stores	3	3.75	3	14.29	6	5.94
Aqua Sports/Dive Shops	2	2.50	0	0.00	2	1.98
Eatery/Fastfoods	2	2.50	2	9.52	4	3.96
Travel & Tours	1	1.25	0	0.00	1	0.99
Spa & Massage Clinics	1	1.25	0	0.00	1	0.99
Pawnshops & Lending	1	1.25	0	0.00	1	0.99
Bakery	1	1.25	0	0.00	1	0.99
Dry Goods/RTW	1	1.25	0	0.00	1	0.99
Internet/Computer Shops	1	1.25	0	0.00	1	0.99
Banks/Forex	1	1.25	0	0.00	1	0.99
Beauty Parlors	1	1.25	0	0.00	1	0.99
Drugstores/Hospitals	0	0.00	1	4.76	1	0.99
Fruits & Vegetable Vendors	0	0.00	3	14.29	3	2.97
Meat & Fish Vendors	0	0.00	1	4.76	1	0.99
Funeral Parlors	0	0.00	2	9.52	2	1.98
Other Types	12	15.00	7	33.33	19	18.82
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

(2) Years of Existence

More than half of the businesses surveyed have just started operations, where 51% have just established for not more than five years (Table A.5.2-2). Some 13% of the businesses have existed for more than 15 years. The business establishment that exist the longest is on Boracay Island who had been in business for 23 years. The average is 11.33 years. The average year of existence is 13.5 years for Boracay Island and 3.05 years for the Mainland of Malay.

Table A.5.2-2 Years of Existence of Business Establishments

Years in Existence	Boracay Island		Mainland of Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
0 to 5 years	46	57.5	6	28.57	52	51.49
5 to 10 years	13	16.25	6	28.57	19	18.81
11 to 15 years	11	13.75	4	19.05	15	14.85
More than 15 years	9	11.25	4	19.05	13	12.87
Cannot recall	1	1.25	1	4.76	2	1.98
Total	80	100.00	21	100.00	101	100.00
Most Recent	2007		2007		2007	
Oldest Buss. Establishment	1984		1997		1984	
Ave. Years of Existence	13.5		3.05		11.33	

Source: JICA Study Team

Presented in Table A.5.2-3 is the number of employees of the business establishments covered during the survey. Since majority of the business respondents are cottage- to small-scale businesses the number of people that work for them are few (49%) having less than five employees. The average number of employees for business establishment on Boracay Island is 6.93 and on the Mainland of Malay are 3.14.

Table A.5.2-3 Number of Employees

Number	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
1 to 5	31	38.75	19	90.48	50	49.50
5 to 10	12	15.00	2	9.52	14	13.86
11 to 15	25	31.25	0	0.00	25	24.75
16 to 20	6	7.50	0	0.00	6	5.94
21 to 50	1	1.25	0	0.00	1	0.99
More than 50	5	6.25	0	0.00	5	4.95
Total	80	100.00	21	100.00	101	100.00
Least Number of Employees	1		1		1	
Most Number of Employees	77		9		77	
Average Number of Employees	6.93		3.14		6.14	

Source: JICA Study Team

(2) Floor Area of Business Establishment

Around 63 businesses (62%) had a floor area of more than 25m². The biggest floor area is on Boracay Island with 2,000m². The average floor area of businesses on Boracay Island is 312 m² and it is 207 m² on the Mainland of Malay (Table A.5.2-4).

Table A.5.2-4 Floor Area of Business Establishments

Floor Area (sq. m.)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Less than 5	6	7.50	0	0.00	6	5.94
5 to 10	4	5.00	4	19.05	8	7.92
11 to 15	3	3.75	0	0.00	3	2.97
16 to 20	9	11.25	1	4.76	10	9.90
21 to 25	4	5.00	0	0.00	4	3.96
More than 25	49	61.25	14	66.67	63	62.38
Not Applicable	5	6.25	2	9.52	7	6.93
Total	80	100.00	21	100.00	101	100.00
Smallest Floor Area	3		10		3	
Biggest Floor Area	2000		1200		2000	
Average Floor Area	312.73		207.20		290.21	

Source: JICA Study Team

(3) Annual Turnover and Estimated Capital

From the survey results, 22% of the businesses have stated annual income between PhP101,000 to PhP200,000 per year (Table A.5.2-5). Some 19% of the respondents did not reveal their annual gross income for the main reason that it is highly confidential for the businesses. The computed average annual income, however, is PhP525,032 for establishments on Boracay Island and PhP133,750 on the Mainland of Malay.

Table A.5.2-5 Annual Turnover of Businesses

Annual Gross Income (PhP)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
1 to 100,000	9	11.25	6	28.57	15	14.85
101,000 to 200,000	13	16.25	9	42.86	22	21.78
201,000 to 300,000	12	15.00	2	9.52	14	13.86
301,000 to 400,000	7	8.75	1	4.76	8	7.92
401,000 to 500,000	4	5.00	0	0.00	4	3.96
501,000 to 600,000	6	7.50	0	0.00	6	5.94
601,000 to 700,000	2	2.50	0	0.00	2	1.98
701,000 to 800,000	1	1.25	0	0.00	1	0.99
801,000 to 900,000	1	1.25	0	0.00	1	0.99
900,000 to 1,000,000	1	1.25	0	0.00	1	0.99
1,100,000.00 and above	8	10.00	0	0.00	8	7.92
No answer (No Info)	16	20.00	3	14.29	19	18.81
Total	80	100.00	21	100.00	101	100.00
Lowest	10,000.00		36,000.00		10,000.00	
Highest	5,376,000.00		360,000.00		5,376,000.00	
Average	525,032.00		133,750.00		443,676.34	

Source: JICA Study Team

In terms of business capital, 46% of the businesses had a starting capital of less than PhP100,000 when the business started. The average starting capital is PhP 3.2 million on Boracay Island and it is PhP 43 thousand on the Mainland of Malay (Table A.5.2-6).

Based on annual income and capital, more investors are grabbing the business opportunities on Boracay Island. During the interview a large portion of foreign and local investors are coming in the island to establish their own businesses. This only proves that Boracay Island will continue to grow in terms of business activities and investments.

Table A.5.2-6 Estimated Capital of Businesses

Estimated Capital (PhP)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
1 to 100,000	28	35.00	17	80.96	45	44.55
101,000 to 200,000	5	6.25	2	9.52	7	6.93
201,000 to 300,000	5	6.25	0	0.00	5	4.95
301,000 to 400,000	4	5.00	0	0.00	4	3.96
401,000 to 500,000	7	8.75	0	0.00	7	6.93
501,000 to 600,000	1	1.25	0	0.00	1	0.99
601,000 to 700,000	0	0.00	0	0.00	0	0.00
701,000 to 800,000	2	2.50	0	0.00	2	1.98
801,000 to 900,000	1	1.25	0	0.00	1	0.99
900,000 to 1,000,000	9	11.25	0	0.00	9	8.91
1,100,000.00 and above	0	0.00	0	0.00	0	0.00
No answer	18	22.50	2	9.52	20	19.81
Total	80	100.00	21	100.00	101	100.00
Lowest	3,000.00		2,800.00		2,800.00	
Highest	1,000,000.00		150,000.00		1,000,000.00	
Average	3,188,829.27		43,816.67		2,560,264.91	

Source: JICA Study Team

(4) Hotel and Restaurant Profile

Among 14 hotels and cottages included in the survey, 28% of them have more than 25 rooms. The highest number of guest rooms is 56 and the average number of rooms is 19 (Table A.5.2-7). During peak season of tourist arrivals on Boracay Island, the average occupancy rate reaches up to 82% (Table A.5.2-8), and during off-peak season it only reaches up to 31% (Table A.5.2-9).

Table A.5.2-7 Number of Guest Rooms for Hotels/Cottages

Number*	Boracay Island	
	No.	Percent
1 to 5	3	21.43
6 to 10	3	21.43
11 to 15	1	7.14
16 to 20	3	21.43
21 to 25	0	0.00
More than 25	4	28.57
Total	14	100.00
Lowest	3	
Highest	56	
Average	19	

Source: JICA Study Team

Table A.5.2-8 Occupancy Rate (Peak Season)

Occupancy Rate	Boracay Island	
	No.	Percent
60%	4	28.57
80%	3	21.43
89%	1	7.14
90%	1	7.14
95%	1	7.14
100%	4	28.57
Total	14	100.00
Ave. Rate during Peak Season	82.43	

Source: JICA Study Team

Table A.5.2-9 Occupancy Rate (Off-Peak Season)

Occupancy Rate	Boracay Island	
	No.	Percent
10%	1	7.14
20%	4	28.57
22%	1	7.14
25%	1	7.14
26.70%	1	7.14
35%	1	7.14
40%	3	21.43
60%	2	14.29
Total	14	100.00
Ave. Occupancy Rate (Off Peak)	31.34	

Source: JICA Study Team

In terms of number of tables for restaurants (Table A.5.2-10), the range is from 1 to 50 tables. The small number of tables is businesses that are into eateries and small canteens. The highest number of tables (50 tables), is from a restaurant on Boracay Island. The average

number of tables in a restaurant on Boracay Island is 14 and on the Mainland of Malay is only four.

Table A.5.2-10 Number of Tables of Hotels and Restaurants

Number of Tables	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
1	0	0.00	1	33.33	1	5.88
4	2	14.29	0	0.00	2	11.76
5	1	7.14	1	33.33	2	11.76
6	1	7.14	0	0.00	1	5.88
7	0	0.00	1	33.33	1	5.88
8	2	14.29	0	0.00	2	11.76
10	2	14.29	0	0.00	2	11.76
15	1	7.14	0	0.00	1	5.88
16	1	7.14	0	0.00	1	5.88
20	2	14.29	0	0.00	2	11.76
22	1	7.14	0	0.00	1	5.88
50	1	7.14	0	0.00	1	5.88
Total	14	100.00	3	100.00	17	100.00
Lowest	1		1		1	
Highest	50		7		50	
Average	14.14		4.33		12.41	

Source: JICA Study Team

(5) Respondent Information

The position of the respondents that were interviewed is shown in Table A.5.2-11. Majority of the respondents (60%) were the owners of the business establishments both on Boracay Island and on the Mainland of Malay. In addition, there were also several business managers (20%) that were interviewed and the rest of the respondents were office and section managers and other permanent staff of the business. A total of 60 respondents were female (59%) and the remaining 41 respondents were male (Table A.5.2-12). In addition, Table A.5.2-13 shows the distribution of the respondents' age, where majority of are within the range of 20-39 years old (49%) and 40-59 years old (43%) which falls under the productive working years of an employee.

Table A.5.2-11 Position of Respondent

Position	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Manager	15	18.75	5	23.81	20	19.80
Deputy Manager	1	1.25	0	0.00	1	0.99
Section Manager	1	1.25	0	0.00	1	0.99
Technical Staff	3	3.75	0	0.00	3	2.97
Owner	47	58.75	14	66.67	61	60.40
Other Permanent Staff						
Cashier	2	2.50	0	0.00	2	1.98
Helper	1	1.25	0	0.00	1	0.99
HRD Officer	1	1.25	0	0.00	1	0.99
In-Charge	1	1.25	1	4.76	2	1.98
Secretary	3	3.75	0	0.00	3	2.97
Cost Control Officer	1	1.25	0	0.00	1	0.99
Reservations Officer	1	1.25	0	0.00	1	0.99
Sales Lady	2	2.50	0	0.00	2	1.98
Secretary/Treasurer	1	1.25	0	0.00	1	0.99
Substitute operator	0	0.00	1	4.76	1	0.99
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

Table A.5.2-12 Gender Distribution of Respondent

Gender	Boracay Island		Mainland of Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Male	33	41.25	8	38.10	41	40.59
Female	47	58.75	13	61.90	60	59.41
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

Table A.5.2-13 Age Distribution of Respondent

Age	Boracay Island		Mainland of Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Less than 20 years old	3	3.75	0	0.00	3	2.98
20 - 39 years old	40	50.00	10	47.62	50	49.50
40 - 59 years old	35	43.75	9	42.86	44	43.56
More than 60 years old	2	2.50	2	9.52	4	3.96
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

5.2.2 Awareness on Solid Waste and Environment

(1) Environment and Solid Waste Concerns

The business establishment respondents were asked regarding perceptions on the cleanliness of the business areas. In addition, they were also asked about the problems encountered in maintaining cleanliness and the different clean-up activities the business is undertaking and participating in.

(2) Perception on Cleanliness

The perception on the cleanliness of the business establishment and surroundings are shown in Table A.5.2-14. Majority (47%) were proud of the cleanliness of the business establishment especially businesses on Boracay Island. On the other hand, 13 business establishments on the Mainland of Malay perceived the establishments/surroundings are clean enough. A total of 17 business establishments perceived that the business establishment/ surroundings are not so clean (18%).

Table A.5.2-14 Level of Awareness on Cleanliness

Perception of Cleanliness	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
I don't think that it is so clean.	12	15.00	6	28.57	18	17.82
I think that it is clean but not enough to be proud of	22	27.50	13	61.90	35	34.65
I think that it is too clean to be proud of	46	57.50	2	9.53	48	47.53
I have no idea	0	0.00	0	0.00	0	0.00
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

1) Cleaning Activities Participated

In Table A.5.2-15, majority of the business establishments participate and adhere in the segregation of waste set by the municipality (79 establishments). In addition, there are 46 businesses that clean only around the vicinity of their business. A total of 21 establishments participate in the clean-up activities on Boracay Island and the Mainland of Malay and 19 businesses train and teach the staff on the proper maintenance of cleanliness on the business premises.

Table A.5.2-15 Cleaning Activities

Activities	Boracay Island	Mainland Malay	Total
	No.	No.	No.
Clean around our business establishment only	32	14	46
Segregate solid waste	65	14	79
Participate in voluntary clean-up activities	17	4	21
Train / Teach our staff to maintain cleanliness	17	2	19
Total	131	34	165

Source: JICA Study Team

2) Business Establishments Problems on Cleanliness

As can be observed in Table A.5.2-16, 14 of the establishments were problems on the indiscriminate throwing of solid waste in their area. In addition, other observed problems were the scattering of waste in the collection points (11 responses), proliferation of insects and worms due to waste and foul odor from the surrounding waste treatment facility. It is however worthy to note that at most only 37 out of 101 establishments were encountering

problems on cleanliness, the rest of the establishments does not experience any problems and maintain the cleanliness of their business areas.

Table A.5.2-16 Problems Caused by Solid Waste

Problems	Boracay Island	Mainland Malay	Total
	No.	No.	No.
Indiscriminate throwing of solid waste anywhere	12	2	14
Scattering waste in waste collection points	11	0	11
Foul odor from surrounding waste treatment and disposal facility	4	2	6
Insect, pest, and worms proliferation due to scattering solid waste	3	2	5
Contamination or pollution of water source by leachate from dumping site or other solid waste treatment facilities	1	0	1
Degradation of landscape due to solid waste treatment and disposal facility	0	0	0
Total	31	6	37

Source: JICA Study Team

5.2.3 Knowledge Regarding Solid Waste Management and 3R Activities (Reduce, Reuse, Recycle)

Table A.5.2-17 presents the problems mentioned in the current public collection service.

Majority of the business establishments on the Mainland of Malay do not experience any problem in the public waste collection service (74%), since majority adhere to the municipal ordinance on solid waste management. Some of business establishments, especially on the Mainland of Malay are experiencing problems in the public collection service. The problem informed by the respondents is unstable collection schedule and frequency of collection. Some of the business establishments have problems on collection because the waste collection vehicle will not collect wastes that are not segregated which are the usual case that can be found in public garbage cans. Business establishments do not have time segregating the garbage cans in the public area located at the front of their businesses.

Table A.5.2-17 Problems regarding the Public Waste Collection Service

Presence of Problems	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Yes	15	18.75	8	38.10	23	22.77
No	62	77.50	13	61.90	75	74.26
No Idea	3	3.75	0	0.00	3	2.97
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

(1) Awareness of the Solid Waste Management Program

Majority of the respondents were highly aware of the policies guiding the implementation of the solid waste management in the whole municipality. In Table A.5.2-18, it is clear that business establishments on Boracay are more aware of the different policies on solid waste management as compared to businesses on the Mainland of Malay. There are three (3) establishments on the Mainland of Malay who claim that there is no collection in their area.

Table A.5.2-18 Level of Awareness on SWM Policies

Level of Awareness	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Date / Day of SW Collection	77	96.25	12	57.14	89	88.12
Time of Discharging SW	77	96.25	12	57.14	89	88.12
Place of Discharging SW	79	98.75	12	57.14	91	90.10
Classification of Segregation	78	97.50	14	66.67	92	91.09
Others (No collection)	0	0.00	3	14.29	3	2.97

Source: JICA Study Team

(2) Sources of Information on Solid Waste Management

Based on Table A.5.2-19, 71 business establishments mainly rely on government announcements regarding solid waste management. In addition, 38 respondents receive information and additional knowledge from radio and 26 establishments from other NGOs and CBOs. The other sources of information are from neighbors, television and from newspapers and newsletters.

Table A.5.2-19 Sources of Information on Solid Waste Management

Sources	Boracay Island	Mainland Malay	Total
	No.	No.	No.
Television	9	0	9
Radio	33	5	38
Newspaper / Magazines	4	0	4
Pamphlets / Posters	11	0	11
Government Announcements	57	14	71
NGOs / CBOs	25	1	26
Neighbors	9	1	10
Total	148	21	169

Source: JICA Study Team

(3) Adherence to SWM Segregation

Table A.5.2-20 presents adherence to SWM policy on waste segregation. Majority of the business (73%) believes that it is important the segregate food waste and recyclables from other type of wastes. Food waste must be segregated because it is important that it should be dispose right away for it is highly biodegradable. In addition recyclables are separated because it is a source of additional income if they sell all the recyclables to junk shop buyers. It should be noted that two establishments on the Mainland of Malay are not willing to do waste segregation mainly because they do not know the waste categories for segregation.

Table A.5.2-20 Adherence to SWM Ordinance

Waste Segregation	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
All waste should be mixed and without segregation	0	0.00	2	9.52	2	1.98
Only food waste should be separated and discharged from other waste	6	7.50	1	4.76	7	6.93
Only recyclables should be separated from other waste	2	2.50	2	9.52	4	3.96
Only food waste and recyclables should be separated from other waste	69	86.25	5	23.81	74	73.27
Recyclables should not be collected but other waste must be collected	3	3.75	9	42.86	12	11.88
I don't know how to segregate	0	0.00	2	9.52	2	1.98
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

5.2.4 Waste Discharge Activities

The survey had assessed the waste discharging activities of the different business establishments. The business respondents were asked over on the different discharging activities of their business on different types of waste corresponding to waste segregation categories of the municipality. The volume of discharge per establishment was estimated, as well as their capacity to discharge solid waste.

(1) Solid Waste Discharging Activities

Based on Table A.5.2-21, majority of the waste are discharged with segregation. For food waste, 53 establishments discharge by feeding to pets and 44 discharge to public collection service with segregation.

Newspapers are mainly discharged to public collection without segregation (60 responses). There are 26 businesses that discharge newspaper to public collection with segregation.

Majority of the glass bottles, cans and PET bottles are discharged to public collection with segregation and by selling to junk shops. Other types of plastic were also discharged to public collection with segregation, as well as construction and hazardous wastes.

Table A.5.2-21 Waste Discharge Activities of Solid Waste

Activities	Boracay Island	Mainland of Malay	Total
	No.	No.	No.
Food Waste			
Bury	3	1	4
Burn	0	0	0
Feed	35	18	53
Compost	4	0	4
Sell	1	0	1
Discharge with Segregation	43	1	44
Discharge without Segregation	1	0	1
Newspaper/Magazines			
Bury	1	0	1
Burn	1	8	9
Feed	0	0	0
Compost	1	0	1
Sell	18	8	26
Discharge with Segregation	59	1	60
Discharge without Segregation	2	0	2
Others (Re-used)	1		1
Glass Bottles			
Bury	0	1	1
Burn	0	0	0
Feed	0	0	0
Compost	0	0	0
Sell	20	17	37
Discharge with Segregation	59	3	62
Discharge without Segregation	2	1	3
Cans			
Bury	0	0	0
Burn	0	0	0
Feed	0	0	0
Compost	0	0	0
Sell	26	5	31
Discharge with Segregation	53	3	56
Discharge without Segregation	2	0	2
PET Bottles			
Bury	0	2	2
Burn	0	0	0
Feed	0	0	0
Compost	0	0	0
Sell	19	11	30
Discharge with Segregation	57	3	60
Discharge without Segregation	2	0	2
Other Plastics			
Bury	1	2	3
Burn	0	2	2
Feed	0	0	0
Compost	0	0	0
Sell	7	6	13
Discharge with Segregation	69	5	74

Activities	Boracay Island	Mainland of Malay	Total
	No.	No.	No.
Discharge without Segregation	2	0	2
Construction Waste			
Bury	1	0	1
Burn	0	3	3
Feed	0	0	0
Compost	0	0	0
Sell	2	1	3
Discharge with Segregation	34	4	38
Discharge without Segregation	1	0	1
Hazardous Waste			
Bury	2	5	7
Burn	0	0	0
Feed	0	0	0
Compost	1	0	1
Sell	0	1	1
Discharge with Segregation	62	5	67
Discharge without Segregation	1	1	2
Other Types of Waste			
Bury	0	1	1
Burn	0	0	0
Feed	0	0	0
Compost	0	0	0
Sell	0	0	0
Discharge with Segregation	0	0	0
Discharge without Segregation	0	0	0

Source: JICA Study Team

(2) Frequency of Waste Discharge

Table A.5.2-22 presents the frequency of waste discharge of the different business establishments. For food waste, majority of the businesses discharge on a daily basis or seven times per week (69%). There are 27 establishments that do not discharge food waste because it is fed to pets. Recyclables on the average are discharged four (4) times a week and residual wastes are discharged five times a week. Still, majority of the business establishments discharge recyclable and residual waste on the daily basis, 31% and 39% respectively.

Table A.5.2-22 Frequency of Waste Discharge

Frequency of Discharge (times/week)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Food Wastes						
0	17	21.25	10	47.62	27	26.73
1	0	0.00	1	4.76	1	0.99
2	2	2.50	0	0.00	2	1.98
3	0	0.00	0	0.00	0	0.00
4	1	1.25	0	0.00	1	0.99
5	0	0.00	0	0.00	0	0.00
6	0	0.00	0	0.00	0	0.00
7	60	75.00	10	47.62	70	69.31
Total	80	100.00	21	100.00	101	100.00
Least	0		0		0	
Most	7		7		7	
Average	11.42		2.62		9.59	
Recyclable Wastes						
0	13	16.25	5	23.81	18	17.82
1	7	8.75	5	23.81	12	11.88
2	11	13.75	3	14.29	14	13.86
3	11	13.75	8	38.10	19	18.81
4	4	5.00	0	0.00	4	3.96
5	2	2.50	0	0.00	2	1.98
6	1	1.25	0	0.00	1	0.99
7	31	38.75	0	0.00	31	30.69
Total	80	100	21	100.00	101	100.00
Least	0		0		0	
Most	7		3		7	
Average	4.44		2.10		3.95	
Residual Wastes						
0	14	17.50	6	28.57	20	19.80
1	4	5.00	1	4.76	5	4.95
2	10	12.50	6	28.57	16	15.84
3	7	8.75	3	14.29	10	9.90
4	8	10.00	0	0.00	8	7.92
5	2	2.50	1	4.76	3	2.97
6	0	0.00	0	0.00	0	0.00
7	35	43.75	4	19.05	39	38.61
Total	80	100.00	21	100.00	101	100.00
Least	0		0		0	
Most	7		7		7	
Average	5.71		1.90		4.92	

Source: JICA Study Team

(3) Volume of Waste Discharge

1) Number of Bags to Discharge per Time

For food waste, majority (69.31%) of the business establishments discharged 7 bags of food wastes per time (Table A.5.2-23). Majority of the businesses are not using bags during discharge but instead use gallon containers for easy handling of food waste. In addition,

majority of the business establishments discharge one bag per time of recyclable wastes (65%) and residual wastes (59%). There are also 13 business establishments who discharged two bags of recyclable wastes per time and 15 businesses discharging two bags of residuals per time.

Table A.5.2-23 Number of Bags Discharge Per Time by Waste Category

Number Discharged (bags per time)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Food Wastes						
0	17	21.25	10	47.62	27	26.73
1	0	-	1	4.76	1	0.99
2	2	2.50	0	-	2	1.98
3	0	-	0	-	0	0.00
4	1	1.25	0	-	1	0.99
5	0	-	0	-	0	0.00
6 or more	0	-	0	-	0	0.99
7	60	75	10	47.62	70	69.31
Total	80	100.00	21	100.00	101	100.00
Recyclable Wastes						
0	12	15.00	5	23.81	17	16.83
1	52	65.00	14	66.67	66	65.35
2	11	13.75	2	9.52	13	12.87
3	2	2.50	0	0.00	2	1.98
4	2	2.50	0	0.00	2	1.98
5	1	1.25	0	0.00	1	0.99
6 or more	0	0.00	0	0.00	0	0.00
Total	80	100.00	21	100.00	101	100.00
Residual Wastes						
0	13	16.25	6	28.57	19	18.81
1	51	63.75	9	42.86	60	59.41
2	11	13.75	4	19.05	15	14.85
3	2	2.50	2	9.52	4	3.96
4	2	2.50	0	0.00	2	1.98
5	1	1.25	0	0.00	1	0.99
6	0	0.00	0	0.00	0	0.00
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

(4) Bag Size and Weight

For food waste, majority of bags being discharged are in small sizes (49 responses) with a weight range of 0.5 to 2 kg. Majority of the establishments discharge 1 kg of food waste per time in small size trash bags (Table A.5.2-24). There are also 19 businesses that discharge medium sized plastic bags and five establishments that discharged large size of plastic bags.

A large proportion of the business establishments also discharged recyclable wastes using the small size plastic bags (37 businesses). Some 22 business establishments use medium size plastic bags and 24 businesses use large size plastic bags (Table A.5.2-25).

In discharging residual waste, 38 business establishments use small size plastic bags, 26 use medium ones and 18 use large ones. Among those who discharged recyclables and residuals, the most common weight for small size bag per discharged is 0.5 kg. For medium size it is 1.0 kg and for large size it is 1.5 kg (Table A.2.5-26).

Table A.5.2-24 Size/Weight of Plastic Bag Disposed Per Time (Food Waste)

Size and Weight (kg)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Small						
0.5	4	9.09	1	20.00	5	10.20
1	39	88.64	4	80.00	43	87.76
2	1	2.27	0	0.00	1	2.04
Total	44	100.00	5	100.00	49	100.00
Medium						
1	2	12.50	1	25.00	2	15.00
1.5	0	0.00	0	0.00	0	0.00
2	11	68.75	3	75.00	14	70.00
4	2	12.50	0	0.00	2	10.00
5	1	6.25	0	0.00	1	5.00
Total	15	100.00	4	100.00	19	100.00
Large						
1	0	0.00	0	0.00	0	0.00
1.5	1	33.33	0	0.00	1	20.00
2	0	0.00	0	0.00	0	0.00
3	2	66.67	2	100.00	4	80.00
Total	3	100.00	2	100.00	5	100.00

Source: JICA Study Team

Table A.5.2-25 Size/Weight of Plastic Bag Disposed Per Time (Recyclables)

Size and Weight (kg)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Small						
0.5	28	84.85	4	100.00	32	86.49
1	3	9.09	0	0.00	3	8.11
2	2	6.06	0	0.00	2	5.40
Total	33	100.00	4	100.00	37	100.00
Medium						
0.5	0	0.00	0	0.00	0	0.00
1	15	93.75	6	100.00	21	95.45
2	1	6.25	0	0.00	1	4.55
7	0	0.00	0	0.00	0	0.00
Total	16	100.00	6	100.00	22	100.00
Large						
1	0	0.00	0	0.00	0	0.00
1.5	12	66.67	6	100.00	18	75.00
3	2	11.11	0	0.00	2	8.33
4.5	4	22.22	0	0.00	4	16.67
Total	18	100.00	6	100.00	24	100.00

Source: JICA Study Team

Table A.5.2-26 Size/Weight of Plastic Bag Disposed Per Time (Residuals)

Size and Weight (kg)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Small						
0.5	27	87.10	6	85.71	33	86.84
1	3	9.68	1	14.29	4	10.53
2	1	3.22	0	0.00	1	2.63
Total	31	100.00	7	100.00	38	100.00
Medium						
0.5	0	0.00	0	0.00	0	0.00
1	19	95.00	4	66.67	23	88.46
2	1	5.00	2	33.33	3	11.54
Total	20	100.00	6	100.00	26	100.00
Large						
1	1	6.25	0	0.00	1	5.56
1.5	11	68.75	2	100.00	13	72.22
3	2	12.50	0	0.00	2	11.11
4.5	2	12.50	0	0.00	2	11.11
Total	16	100.00	2	100.00	18	100.00

Source: JICA Study Team

(5) Price of Plastic Trash Bags

There are very business establishments who purchased trash bags for waste discharge. On a regular monthly basis, there are two businesses that purchase small trash bags for PhP1 to PhP10. For recyclable and residual wastes, there is a business establishment that purchases large size trash bags for PhP6 to PhP10 per month (Table A.5.2-27 to Table A.5.2-29).

Table A.5.2-27 Price of Plastic Bag Per Month by (Food Waste)

Price (PhP)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Small Size						
0	78	97.5	20	100.00	78	97.50
1.00 - 5.00	1	1.25	0	0.00	1	1.25
6.00 - 10.00	1	1.25	0	0.00	1	1.25
Total	80	100.00	0	100.00	101	100.00
Medium Size						
0.00	80	100.00	21	100.00	101	100.00
1.00 to 5.00	0	0.00	0	0.00	0	0.00
6.00 to 10.00	0	0.00	0	0.00	0	0.00
Total	80	100.00	21	100.00	101	100.00
Large Size						
0.00	80	100.00	21	100.00	101	100.00
1.00 to 5.00	0	0.00	0	0.00	0	0.00
6.00 to 10.00	0	0.00	0	0.00	0	0.00
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

Table A.5.2-28 Price of Plastic Bag Per Month by (Recyclables)

Price (PhP)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Small Size						
0.00	80	100.00	21	100.00	101	100.00
1.00 to 5.00	0	0.00	0	0.00	0	0.00
6.00 to 10.00	0	0.00	0	0.00	0	0.00
Total	80	100.00	21	100.00	101	100.00
Medium Size						
0.00	80	100.00	21	100.00	101	100.00
1.00 to 5.00	0	0.00	0	0.00	0	0.00
6.00 to 10.00	0	0.00	0	0.00	0	0.00
Total	80	100.00	21	100.00	101	100.00
Large Size						
0.00	79	98.75	21	100.00	100	99.01
1.00 to 5.00	0	0.00	0	0.00	0	0.00
6.00 to 10.00	1	1.25	0	0.00	1	0.99
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

Table A.5.2-29 Price of Plastic Bag Per Month by (Residuals)

Price (PhP)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Residual Waste						
Small Size						
0.00	80	100.00	21	100.00	101	100.00
1.00 to 5.00	0	0.00	0	0.00	0	0.00
6.00 to 10.00	0	0.00	0	0.00	0	0.00
Total	80	100.00	21	100.00	101	100.00
Medium Size						
0.00	80	100.00	21	100.00	101	100.00
1.00 to 5.00	0	0.00	0	0.00	0	0.00
6.00 to 10.00	0	0.00	0	0.00	0	0.00
Total	80	100.00	21	100.00	101	100.00
Large Size						
0.00	79	98.75	21	100.00	100	99.01
1.00 to 5.00	0	0.00	0	0.00	0	0.00
6.00 to 10.00	1	1.25	0	0.00	1	0.99
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

(5) Capacity of Business Establishments to Discharge Waste

Table A.5.2-30 presents the capacity of business establishments in storing waste in terms of number of days before discharge, the distance they can travel to discharge wastes from the establishments and willingness to purchase plastic trash bags for waste segregated discharge.

1) Waste Storage Capacity

Majority of the business establishments can keep food waste (61%), recyclables (36%), and residuals (39%) for only one day. The duration range of zero to seven days was acquired during the survey with an average of 1.76 days for food wastes. Businesses can store recyclables for an average of 3.96 days and their residual wastes for 3.39 days.

Table A.5.2-30 Storage Capability by Waste Category

Number of Days	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Food Wastes						
0	22	27.50	12	57.15	34	33.66
1	55	68.75	7	33.33	62	61.39
2	3	3.75	1	4.76	4	3.96
7	0	0.00	1	4.76	1	0.99
Total	80	100.00	21	100.00	101	100.00
Average	1.5		2.75		1.76	
Recyclable Wastes						
0	12	15.00	3	14.29	15	14.85
1	35	43.75	2	9.52	37	36.63
2	9	11.25	4	19.05	13	12.87
3	8	10.00	5	23.81	13	12.87
4	5	6.25	1	4.76	6	5.94
5	2	2.50	1	4.76	3	2.97
6	2	2.50	0	0.00	2	1.98
7	7	8.75	5	23.81	12	11.88
Total	80	100.00	21	100.00	101	100.00
Average	3.86		4.36		3.96	
Residual Wastes						
0	13	16.25	7	33.33	20	19.80
1	36	45	3	14.29	39	38.61
2	10	12.5	6	28.57	16	15.84
3	10	12.5	2	9.52	12	11.88
4	6	7.5	1	4.76	7	6.93
5	2	2.5	1	4.76	3	2.97
6	1	1.25	0	0.00	1	0.99
7	2	2.5	1	4.76	3	2.97
Total	80	100.00	21	100.00	101	100.00
Average	3.57		2.72		3.39	

Source: JICA Study Team

2) Average Distance to Discharge Waste

The business respondents preferred a shorter distance in discharging wastes; if possible they can readily discharge their waste in front of the establishments (Table A.5.2-31). The most common distance to discharge waste is 0 to 10 m for food, recyclable and residual wastes. The shortest distance for all categories is zero and the farthest is 500 m. The average distance for food waste is 63.97 m, for recyclable it is 41.12 m and for residuals it is 45.10 m.

Table A.5.2-31 Distance of Discharge Waste

Distance	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Food Wastes						
0 Meters	44	55.00	16	76.19	60	59.41
1 to 10 Meters	27	33.75	1	4.76	28	27.72
11 to 20 Meters	4	5.00	1	4.76	5	4.95
21 to 30 Meters	1	1.25	0	0.00	1	0.99
31 to 40 Meters	1	1.25	0	0.00	1	0.99
41 to 50 Meters	1	1.25	0	0.00	1	0.99
More than 50 Meters	2	2.50	3	14.29	5	4.95
Total	80	100.00	21	100.00	101	100.00
Shortest Distance	0		0		0	
Farthest Distance	350		500		500	
Average Distance	37.61		164.40		63.97	
Recyclable Wastes						
0 Meters	28	35.00	8	38.10	36	35.64
1 to 10 Meters	41	51.25	8	38.10	49	48.51
11 to 20 Meters	4	5.00	1	4.76	5	4.95
21 to 30 Meters	2	2.50	0	0.00	2	1.98
31 to 40 Meters	1	1.25	0	0.00	1	0.99
41 to 50 Meters	1	1.25	0	0.00	1	0.99
More than 50 Meters	3	3.75	4	19.04	7	6.93
Total	80	100.00	21	100.00	100.00	100.00
Shortest Distance	0		0		0	
Farthest Distance	200		500		500	
Average Distance	27.57		92.75		41.12	
Residual Wastes						
0 Meters	30	37.50	11	52.38	41	40.59
1 to 10 Meters	40	50.00	6	28.57	46	45.54
11 to 20 Meters	3	3.75	1	4.76	4	3.96
21 to 30 Meters	2	2.50	0	0.00	2	1.98
31 to 40 Meters	1	1.25	0	0.00	1	0.99
41 to 50 Meters	1	1.25	0	0.00	1	0.99
Total						
More than 50 Meters	3	3.75	3	14.29	6	5.94
Shortest Distance	0		0		0	
Farthest Distance	200		500		500	
Average Distance	27.57		111.88		45.10	

Source: JICA Study Team

3) Willingness to Buy Trash Bags

As can be seen in Table A.5.2-32, majority of the business establishments are not willing to buy trash bags for waste discharge (74%). Those who are willing (26 businesses) to buy trash bags can spare an average amount of PhP223.00 per month. The most common amount for purchasing trash bags are PhP101 and above (58%), PhP31 to PhP40 (11%) and PhP71 to PhP80 (11%).

Table A.5.2-32 Willingness to Buy Trash Bags

Willingness	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Not Willing	56	70.00	19	90.48	75	74.26
Willingness	24	30.00	2	9.52	26	25.74
Total	80	100.00	21	100.00	101.00	100.00

Source: JICA Study Team

Table A.5.2-33 Amount of Payment for the Trash Bags

Amount (PhP)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
10.00 to 20.00	1	4.17	0	0.00	1	3.85
21.00 to 30.00	3	12.50	0	0.00	3	11.54
31.00 to 40.00	0	0.00	0	0.00	0	0.00
41.00 to 50.00	1	4.17	0	0.00	1	3.85
51.00 to 60.00	1	4.17	0	0.00	1	3.85
61.00 to 70.00	1	4.17	0	0.00	1	3.85
71.00 to 80.00	2	8.33	1	50.00	3	11.54
81.00 to 90.00	1	4.17	0	0.00	1	3.85
91.00 to 100.00	0	0.00	0	0.00	0	0.00
101.00 and above	14	58.33	1	50.00	15	57.69
Total	24	100.00	2	100.00	26	100.00
Highest	1400.00		120.00		1400.00	
Lowest	10.00		80.00		10.00	
Average	233.97		100.00		223.66	

Source: JICA Study Team

4) Implementation of 3R Activities

Table A.5.2-34 shows the most popular 3R activities of the business establishments. Based from the common 3R activities, the using the kitchen wastes to feed to animals is the most popular activity and always being done by the businesses (33%). Other activities in the table are not applicable to the businesses because only a small proportion of the survey respondents have kitchens. The most common activity to all of the business establishment respondents is the repair and re-use of broken things. Based on the table, only 12% among the respondents do this activity every time and 33% sometimes do this activity.

Table A.5.2-34 Implementing 3R Activities

3R Activities	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Reduce Kitchen Wastes in Cooking Process						
Don't Do It At All	21	26.25	10	47.62	31	30.69
Sometimes Do It	12	15	4	19.05	16	15.84
Often Do It	3	3.75	1	4.76	4	3.96
Do It Every time	13	16.25	1	4.76	14	13.86
Not Applicable	31	38.75	5	23.81	36	35.64
Total	80	100.00	21	100.00	101	100.00
Using Kitchen Waste to Feed Animals						
Don't Do It At All	17	21.25	0	0.00	17	16.83
Sometimes Do It	10	12.5	0	0.00	10	9.90
Often Do It	5	6.25	0	0.00	5	4.95
Do It Every time	17	21.25	16	76.19	33	32.67
Not Applicable	31	38.75	5	23.81	36	35.64
Total	80	100.00	21	100.00	101	100.00
Using Kitchen Waste to Make Compost						
Don't Do It At All	29	36.25	8	38.10	37	36.63
Sometimes Do It	10	12.5	2	9.52	12	11.88
Often Do It	6	7.5	2	9.52	8	7.92
Do It Every time	4	5	4	19.05	8	7.92
Not Applicable	31	38.75	5	23.81	36	35.64
Total	80	100.00	21	100.00	101	100.00
Repair and Reuse of Broken Things						
Don't Do It At All	41	51.25	8	38.10	49	48.51
Sometimes Do It	25	31.25	8	38.10	33	32.67
Often Do It	3	3.75	4	19.05	7	6.94
Do It Every time	11	13.75	1	4.75	12	11.88
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

5.2.5 Opinion of Current Public Collection Service

The different opinions of the business establishments were asked in order to determine their level of satisfaction on the current public collection activities. The tables presented under this section can form part of the solid waste management program evaluation, especially in measuring the level of satisfaction of the program beneficiaries particularly the different business establishments in the municipality.

(1) Business Establishments Level of Satisfaction to Public Collection Service

Table A.5.2-35 presents the satisfaction level of business establishments on the public collection service. Majority of the businesses on Boracay Island (65%) are highly satisfied with the service, 27% are a little satisfied and there are about 5 establishments who are not satisfied at all. On the Mainland of Malay, 10 of the establishments are satisfied and eight (8) are unsatisfied with the public collection service. This result reflects the fact that there

are some business establishments on the Mainland of Malay who have stated that there is no waste collection activity in their area.

Table A.5.2-35 Opinion on Current Public Collection

Level of Satisfaction	Boracay Island		Mainland of Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Very Satisfied	52	65.00	5	23.81	57	56.44
A Little Satisfied	22	27.50	5	23.81	27	26.73
Not Satisfied at All	5	6.25	8	38.10	13	12.87
No Opinion	1	1.25	3	14.28	4	3.96
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

Reasons for satisfaction include; garbage collection is always on schedule (46 responses) (Table A.5.2-36). Other significant reasons for satisfaction are the uncomplicated segregation categories (26 responses), segregation is actively done in their business establishments (26 responses) and the frequency of collection is often (17 responses).

Table A.5.2-36 Aspect of Service Being Satisfied

Aspect	Boracay Island	Mainland Malay	Total
	No.	No.	No.
Collection time is on schedule	43	3	46
Collection frequency is often	15	2	17
Segregation at our business is actively done	16	2	18
It is easy to understand what item should be separated	23	3	26
Instruction for source separation is not that strict	3	0	3
Others (Disposal is very easy)	0	1	1
Total	100	11	111
Total No. of Satisfied	74	10	84

Source: JICA Study Team

Among the business establishments who are not satisfied with the public collection service, the major reason is that collection frequency is too few in their business location (6 responses). Seven business establishments on the Mainland of Malay have stated that there is no collection activity in their area and other reasons were pertaining to adherence in the waste segregation (Table A.5.2-37).

Table A.5.2-37 Aspect of Service Being Not Satisfied

Aspect	Boracay Island	Mainland Malay	Total
	No.	No.	No.
Collection time is too early to discharge waste	2	0	2
Collection frequency is few	3	3	6
Segregation at our house is an additional burden and laborious	0	1	1
It is not easy to understand what item should be separated	1	1	2
Instruction for source separation is very strict	1	1	2
Monitoring is not active	1	0	1
Compliance monitoring is not done properly	0	1	1
Others (No collection here)	0	7	7
Total	8	14	22
Total No. Not Satisfied	8	14	22

Source: JICA Study Team

Opinion on Current Public Collection Service, Table A.5.2-38 presents the overall opinions of the business establishment respondents on the current public collection service. Regarding time of waste discharge, 83% among the businesses stated to maintain the current time of discharge. Several of the businesses (10 respondents) have suggested changing the time of discharge to 6:00 AM up to 9:00 AM.

In terms of collecting food wastes, majority of the businesses (79%) stated to maintain the current schedule of discharge and 14 establishments want to increase the number of collection. Thirteen (13) establishments suggested that the collection frequency increase to seven times per week and one business establishment suggested that it increase to 14 times per week.

In terms of collecting recyclables and residuals, still majority of the business establishments (78%) suggested to maintain the current frequency of collection. Under the collection of recyclable waste, 15 businesses want to increase the collection frequency to three to eight times per week and 10 establishments suggested that the collection frequency of residual wastes increase to three to seven times per week.

Table A.5.2-38 Opinion on Current Public Collection Service

Opinion	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Time of Discharge						
Keep it as is	72	90.00	12	15.00	84	83.17
Change schedule to:						
6:00 AM	2	2.50	0	0.00	2	1.98
7:00 AM	2	2.50	2	2.50	4	3.96
7:30 AM	1	1.25	0	0.00	1	0.99
8:00 AM	2	2.50	0	0.00	2	1.98
9:00 AM	1	1.25	0	0.00	1	0.99
No Answer	0	0.00	7	8.75	7	6.93
Total	80	100.00	21	100.00	101	100.00
Food Waste Collection Frequency						
Keep it as is	71	88.75	9	11.25	80	79.21
Increase Collection						
7 times a week	8	10.00	5	6.25	13	12.87
14 times a week	1	1.25	0	0.00	1	0.99
Reduce Collection	0	0.00	0	0.00	0	0.00
No Answer	0	0.00	7	8.75	7	6.93
Total	80	100.00	21	100.00	101	100.00
Recyclables Collection Frequency						
Keep it as is	69	86.25	10	47.62	79	78.22
Increase Collection						
3 times a week	2	2.50	3	14.29	5	4.95
5 times a week	2	2.50	0	0.00	2	1.98
7 times a week	6	7.50	1	4.76	7	6.93
8 times a week	1	1.25	0	0.00	1	0.99
Reduce Collection	0	0.00	0	0.00	0	0.00
No Answer	0	0.00	7	33.33	7	6.93
Total	80	100.00	21	100.00	101	100.00
Residual Waste Collection Frequency						
Keep it as is	69	86.25	10	47.62	79	78.22
Increase Collection						
3 times a week	2	2.50	3	14.29	5	4.95
4 times a week	2	2.50	0	0.00	2	1.98
7 times a week	7	8.75	1	4.76	8	7.92
Reduce Collection	0	0.00	0	0.00	0	0.00
No Answer	0	0.00	7	33.33	7	6.93
Total	80	100.00	21	100.00	101	100.00
Number of Source Separation Categories						
Keep it as is	80	100.00	14	66.67	94	93.07
Reduce Categories	0	0.00	0	0.00	0	0.00
Increase Categories	0	0.00	0	0.00	0	0.00
No Answer	0	0.00	7	33.33	7	6.93
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

5.2.6 Willingness to Pay for Waste Collection

The willingness to pay for waste collection services is needed to determine in order to provide the solid waste management program of Malay regarding a workable policy towards sustaining the implementation of the program on the local level. The different business

establishments on the Mainland of Malay are commonly paying a waste and garbage collection fee amounting to PhP1,800 per year in the municipal office during annual processing of mayor's permit. However, in good consideration for the small-scale businesses in the municipality, some of the cottage-scale and livelihood businesses in both Boracay Island and the Mainland of Malay are not liable to pay an annual waste collection fee.

(1) Payment of Current Waste Collection Fee

Based on Table A.5.2-39, 79% of the businesses are aware and paying regularly the annual waste collection fee, there are nine establishments who do not pay such fees and 12 establishments who are not well oriented on this matter.

Table A.5.2-39 Payment of Waste Collection Fee of Business Establishments

Payment of Waste Collection Fee	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Yes, we pay it regularly	65	81.25	15	71.43	80	79.21
Yes, we sometimes pay it	0	0.00	0	0.00	0	0.00
No, we don't	4	5.00	5	23.81	9	8.91
I don't know the system	11	13.75	1	4.76	12	11.88
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

In Table A.5.2-40, 52% among businesses who pay an annual garbage fee is spending an average of PhP150 per month on waste collection services. Some of the businesses are paying an average of PhP300 per month (16%) and some are paying as low as PhP100 per month (6%) to as high as PhP1,000 per month (1%). The average waste collection fee being paid by business establishments is PhP373 per month.

Table A.5.2-40 Amount of Payment for the Current Collection Service per Month

Amount (PhP/month)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
100	4	6.15	1	6.67	5	6.25
120	0	0.00	1	6.67	1	1.25
150	39	60.00	3	20.00	42	52.50
200	3	4.62	1	6.67	4	5.00
280	1	1.54	0	0.00	1	1.25
300	9	13.85	4	26.67	13	16.25
400	2	3.08	1	6.67	3	3.75
500	3	4.60	2	13.33	5	6.25
600	1	1.54	1	6.67	2	2.50
800	1	1.54	1	6.67	2	2.50
850	1	1.54	0	0.00	1	1.25
1,000	1	1.54	0	0.00	1	1.25
Total	65	100.00	15	100.00	80	100.00
Average Amount	387.05		314.45		373.09	
Lowest Amount	100.00		100.00		100.00	
Highest Amount	1000.00		800.00		1000.00	

Source: JICA Study Team

(2) Willingness to Pay

Table A.5.2-41 presents the number of business establishments willing to pay more than the current garbage fee. Some 21% among the business establishments are willing to pay more than the current garbage collection fee.

Table A.5.2-41 Willingness to Pay More than the Present Garbage Fee

Willingness	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
Yes	16	20.00	5	23.81	21	20.79
No	64	80.00	16	76.19	80	79.21
Total	80	100.00	21	100.00	101	100.00

Source: JICA Study Team

From the 21 establishments who were willing to pay an additional waste collection fee, seven of the businesses are willing to pay an additional Php500 per month (Table A.5.2-42). Four among them can pay Php200 and three businesses are willing to pay Php150 per month. The average amount of additional waste collection fee willing to be paid is Php285.

Table A.5.2-42 Additional Amount Willing to Pay for Waste Collection

Amount (Php/month)	Boracay Island		Mainland Malay		Total	
	No.	Percent	No.	Percent	No.	Percent
100	1	6.25	0	0.00	1	4.76
150	1	6.25	2	40.00	3	14.29
170	1	6.25	0	0.00	1	4.76
175	1	6.25	0	0.00	1	4.76
200	3	18.75	1	20.00	4	19.05
250	1	6.25	0	0.00	1	4.76
400	2	12.5	0	0.00	2	9.52
500	5	31.25	2	40.00	7	33.33
600	1	6.25	0	0.00	1	4.76
Total	16	100.00	5	100.00	21	100.00
Average	285.90		283.33		285.29	
Lowest	100.00		150.00		100.00	
Highest	600.00		500.00		600.00	

Source: JICA Study Team

(3) Opinions and Idea Related to Solid Waste Management

Table A.5.2-43 presents the opinion of the respondents on solid waste management. The most common comment after those that have no ideas is that regular collection should be done followed by regular monitoring for compliance to the solid waste management ordinance of the municipality. Other comments are shown below.

Table A.5.2-43 Honest Opinion on Solid Waste Management

Opinion/Comments	Num.
No idea/No comment	45
I see no problems/SWM is ok	15
Regular collection should be done/More garbage trucks	8
Regular monitoring for compliance on SWM	7
No waste collection here	7
Increase/Improve trash bins around the island	6
Observe proper disposal of solid wastes	4
Regular clean-up at the beach	2
Needs more improvement	2
Increase awareness on SWM	1
Transparency in where the fees go	1
Collection frequency is too few	1
Unsatisfied with present waste collection	1
SWM is the responsibility of the government/They should segregate	1
Garbage fee is too much	1
Regular checking of facilities (manhole)	1
Improve SWM (Increase MRF)	1
Pro-rate garbage fee	1
Total Responses	105

Source: JICA Study Team

5.3 Tourist Survey

5.3.1 General Information

(1) Country of Targeted Respondents

Majority, 84% or 63% of the respondents are Asians with the Philippines having the highest (33.83%) seconded by Korea with 25.56%. This is followed by European tourists comprising of 24.81% of the total respondents. Among the Europeans, English tourists are the highest with 4.51%. South and North American tourists comprise 12.03% of the respondents with USA having the largest number at 9.02%. Table A.5.3-1 below presents the number of tourist respondents by country.

Table A.5.3-1 Country of Origin

Country of Origin	No.	Percent
Asia		
Philippines	45	33.83
Korea	34	25.56
Japan	3	2.26
Singapore	1	0.75
Indonesia	1	0.75
Sub-Total	84	63.16
South and North America		
USA	12	9.02
Canada	3	2.26
Colombia	1	0.75
Sub-Total	16	12.03
Europe		
England	6	4.51
Germany	5	3.76
Australia	4	3.01
Switzerland	3	2.26
Sweden	2	1.50
Belgium	2	1.50
Norway	2	1.50
United Kingdom	1	0.75
Denmark	1	0.75
London	1	0.75
Ireland	1	0.75
New Zealand	1	0.75
Italy	1	0.75
Spain	1	0.75
Netherlands	2	1.50
Sub-Total	33	24.81
Total	133	100.00

Source: JICA Study Team

(2) Age and Gender of the Respondents

There are 69 or 51.88% female respondents while the male respondents comprise the rest with 48.12% as shown in Table A.5.3-2 below. Majority of the respondents belong to the age group of the youth (20-39 yrs. old) with 60.9%. This is followed by the age group of 40-59 yrs. old with 27.82% of the respondents.

Table A.5.3-2 Gender and Age Range of Tourist Respondents

Gender	No.	Percent
Female	69	51.88
Male	64	48.12
Total	133	100
Age Range	No.	Percent
10 - 19 year-old	8	6.02
20 - 39 year-old	81	60.90
40 - 59 year-old	37	27.82
Over 60 year-old	7	5.26
Total	133	100.00

Source: JICA Study Team

(3) Educational Attainment of the Respondents

Table A.5.3-3 below shows the educational attainment where majority (80.45%) are university degree holders. Some 7.52% are master's degree holders. The rest are senior and junior secondary holders with 9.77% and 2.26% respectively.

Table A.5.3-3 Educational Attainment

Degree	No.	Percent
University (Bachelor or College degree)	107	80.45
Graduate school (Masters degree)	10	7.52
Senior secondary school	13	9.77
Junior secondary school	3	2.26
Total	133	100.00

Source: JICA Study Team

(4) Occupation of the Respondents

As revealed in Table A.5.3-4, majority of the respondents (39.1%) are company employees. Some 15% are independent business owners, 14% are students, 7% are housewives and 6.7% are government employees. Some 3.01% are unemployed and another 3.01% are owner/executives. Other occupations not listed comprise 9%. These other occupations include retirees (3.01%), independent consultant (0.75%) and musician (0.75%)

Table A.5.3-4 Main Occupation

Occupation	No.	Percent
Company Employee	54	40.60
Independent business (incl. Shop owner)	22	6.54
Student	19	4.29
Housewife	10	7.52
Government Employee	9	6.77
Others, (Specify)	8	6.02
Unemployed	4	3.01
Owner executive	4	3.01
Temporary worker (Except student)	2	1.50
Farmer/Fisherfolk	1	0.75
Total	133	100.00

Source: JICA Study Team

(5) Purpose of the Visit

The dominant purpose of tourists in visiting Boracay is for relaxation (107 responses) and marine sports (15 responses). Others came to visit acquaintances (7 responses), check business prospects (7 responses) and for business transactions (3 responses).

Table A.5.3-5 Purpose of Visit

Activity	Number
Do marine sports	15
Relax in Beach	107
Visit Acquaintance	7
Check Business Prospects	7
Do business transaction	3
Total	139

Source: JICA Study Team

(6) Frequency of the Visit

The bulk of tourists are first time visitors (60.9%) as revealed in Table A.5.3-6 below. Some 21.8% are second time visitors and 6.77% are third time visitors. The rest 10.53% have visited for more than three times.

Table A.5.3-6 Number of Visits to Boracay Island

Number of Visits	Frequency	Percent
First time	81	60.90
Second time	29	21.80
More than 3 times	14	10.53
Third time	9	6.77
Total	133	100.00

Source: JICA Study Team

(7) Duration of the Stay

The tourists were asked on the duration of stay in the country to find out if visit to Boracay Island was the main itinerary. This can be known by comparing the duration of stay in the country against stay in the island. As revealed in Table A.5.3-7, majority of the tourists stay for about 4 days (11.28%).

Table A.5.3-7 Duration of Stay in the Philippines

Days of Stay	No.	Percent
0*	45	33.83
2	7	5.26
3	8	6.02
4	15	11.28
5	10	7.52
6	8	6.02
7	5	3.76
8	7	5.26
9	1	0.75
10	2	1.50
11	2	1.50
12	1	0.75
13	1	0.75
14	3	2.26
15	7	5.26
17	1	0.75
21	4	3.01
28	1	0.75
30	2	1.50
36	1	0.75
60	2	1.50
Total	133	100.00

Source: JICA Study Team

The duration of stay on the Mainland of Malay (includes the Province of Aklan) reveals that majority of the tourists stay is 3 days (Table A.5.3-8). With reference to the previous table, it could be concluded that majority of the tourists have Aklan as the primary destination.

Table A.5.3-8 Duration of Stay on the Mainland of Malay

Days of Stay	No.	Percent
0*	8	6.02
1	7	5.26
2	8	6.02
3	36	27.07
4	21	15.79
5	14	10.53
6	4	3.01
7	16	12.03
9	1	0.75
10	5	3.76
11	1	0.75
12	1	0.75
14	4	3.01
15	3	2.26
17	1	0.75
28	1	0.75
36	1	0.75
60	1	0.75
Total	133	100.00

Source: JICA Study Team

Majority of the respondents (30.08%) stayed for 3 days. Again, this shows that the tourists' main reason in visiting the country is to go to Boracay. Table A.5.3-9 shows the duration of stay in the island of the tourists.

Table A.5.3-9 Duration of Stay on Boracay Island

Days of Stay	No.	Percent
1	8	6.02
2	10	7.52
3	40	30.08
4	22	16.54
5	14	10.53
6	4	3.01
7	16	12.03
9	1	0.75
10	6	4.51
11	1	0.75
12	1	0.75
14	6	4.51
15	1	0.75
28	1	0.75
35	1	0.75
60	1	0.75
Total	133	100

Source: JICA Study Team

- (8) Name of the Hotel or Resort Which the Respondent Stay in
Majority (9.02%) of the respondents were booked in Boracay Regency Hotel, seconded by Real Maris Resort (6.77%) and Boracay Tropics Resort (5.26%). The other respondents stayed in other hotels and resort in the area as shown in Table A.5.3-10.

Table A.5.3-10 Hotel Accommodations

Hotel/Resort Name	No.	Percent
Alago Park (free accommodation)	1	0.75
Alice in Wonderland Resort	4	3.01
Angol Point Beach Resort	3	2.26
Apartment	2	1.50
Artista Resort	1	0.75
Asya Resort	2	1.50
Bans Beach Resort	2	1.50
Blue Mango Resort	4	3.01
Boracay Beach Resort	1	0.75
Boracay Chalet Resort	1	0.75
Boracay Holiday Resort	1	0.75
Boracay Peninsula Hotel	3	2.26
Boracay Regency Hotel	12	9.02
Boracay Strand Resort	2	1.50
Boracay Tropics Resort	7	5.26
Boracay True Homes	1	0.75
Casa Fiesta Resort	2	1.50
Casa Pilar Resort	1	0.75
Chez de Paris	1	0.75
Chusoy Building	1	0.75
Club Panoly Resort	1	0.75
Dante's Hideaway	1	0.75
Ericko's House	3	2.26
Fairways and Bluewater Resort	1	0.75
Faith Village Resort	3	2.26
Forest Hills Resort	1	0.75
Friday's Resort	2	1.50
Friends' house	1	0.75
Grand Vista Resort	2	1.50
Holiday Resort	2	1.50
Jat Sulsi Room	1	0.75
La Fiesta Resort	1	0.75
Laguna de Boracay Resort	1	0.75
Le Soleil de Boracay	1	0.75
LM Beach Resort	1	0.75
Mandarin Hotel	2	1.50
Mango Ray Resort	5	3.76
Marzon Resort	2	1.50
Merly's Place	1	0.75
Microtel	1	0.75
Nami Beach Resort	1	0.75
Nami Private Villa	1	0.75
Nigi Nigi Nu Noos	2	1.50
Noeme's Place	2	1.50
Noe's Resort	1	0.75
Orchids Resort	2	1.50
Paradise Bay	1	0.75
Paradise Garden Hotel	1	0.75

Hotel/Resort Name	No.	Percent
Punta Rosa Resort	1	0.75
Real Maris Resort	9	6.77
Red Coconut Resort	1	0.75
Rented house	1	0.75
Rizzo Garden Resort	1	0.75
Salazar Compound	1	0.75
Sand Castles Resort	2	1.50
Sea Gaia	2	1.50
Seawind Resort	1	0.75
Seraph Hotel	5	3.76
Serge Palace Resort	1	0.75
Staying at relatives/friends	4	3.01
Sun Village Resort	1	0.75
Sunset Resort	1	0.75
Suzuni Resort	1	0.75
Taz Resort	1	0.75
Villa Camilla Resort	1	0.75
Villa de Oro Resort	3	2.26
Total	133	100.00

Source: JICA Study Team

- (9) Accommodation Fee of the Hotel or Resort Which the Respondent Stay in
- Range of room rates where the tourist stayed is from as low as PhP1,000 and as high as PhP12,000 Majority of the tourists (8.27%) paid in the rang of PhP3,001 to PhP4,000 followed by tourists who paid in the range of PhP1,001 to PhP2,000. Some 6 tourists (4.51%) stayed in resorts with free accommodation. The rest paid in varying ranges as shown in Table A.5.3-11.

Table A.5.3-11 Range of Room Rates

Range (PhP)	No.	Pct.
0	6	4.51
1-1,000	15	1.28
1,001-2,000	31	3.31
2,001-3,000	33	4.81
3,001-4,000	11	8.27
4,001-5,000	15	1.28
5,001-6,000	10	7.52
6,001-7,000	2	1.50
7,001-8,000	2	1.50
8,001-9,000	3	2.26
9,001-10,000	1	0.75
10,001-11,000	3	2.26
11,001-12,000	1	0.75
Total	133	100

Source: JICA Study Team

5.3.2 Perception and Awareness on Environment and Solid Waste

(1) Cleanness of Boracay Island

Majority of the tourists revealed that Boracay Island was clean as mentioned by 60.9%. However, some 37.59% thought that the island was not clean.

Table A.5.3-12 Expectation on Cleanliness of Boracay

Perception	No.	Pct.
I don't think it is clean.	50	37.59
I have no view.	2	1.50
I think it is clean.	81	60.90
Total	133	100.00

Source: JICA Study Team

The tourist believed that tourist should keep Boracay clean for the future as indicated by majority of the respondents (95.49%).

Table A.5.3-13 Opinion on Keeping Boracay Clean for the Future

Response	No.	Percent
Yes	127	95.49
No	6	4.51
Total	133	100.00

Source: JICA Study Team

(2) Future Activities for Cleanness

Majority of the tourists mentioned that they are willing to keep the environment clean by participating in waste reduction program (63 responses), cleaning activities in various levels (48 responses), reduce waste generation (47 responses), pay fee for the beautification of the island and improvement of solid waste management services (44 responses).

Table A.5.3-14 Activities Willing to Do to Keep Environment Clean*

Activities	No.
Tourists should participate in waste reduction program	63
Tourists should participate in cleaning activities in various levels	48
Tourists should reduce solid waste generation	47
Tourists should bring back their waste to main island	9
Tourists should pay fee for beautification of island and improvement of SWM	44
None	3
Others, Specify (Proper waste disposal)	8
I have no view	
Total Responses	222

Source: JICA Study Team

5.3.3 Awareness and Opinion on Solid Waste Discharge

(1) Awareness on Segregation

Majority of the respondents (47.37%) do not know the discharge method employed on waste segregation. For those aware of the discharge methods, some 27.82% cited that the source of information for this awareness is by looking at the notice/label on the trash bins followed by looking at the posters in tricycles (9.77%). The rest mentioned various sources of information as shown in Table A.5.3-15 below.

Table A.5.3-15 Awareness on Waste Segregation and Source of Information

Source of Information	No.	Percent
By looking at the notice/label on trash bins	37	27.82
By looking at the poster in pump boat	2	1.50
By looking at the poster in tricycles	13	9.77
By looking inside the trash bins	4	3.01
By reading local newspapers/newsletters	5	3.76
By watching it on cable TV	3	2.26
I don't know the discharge method	63	47.37
Informed by hotel/resort staff	5	3.76
Others, (simple advertisement)	1	0.75
Total	133	100.00

Source: JICA Study Team

Regarding the manner of discharge of solid waste, 51.88% of the respondents put waste into trash bin with segregation while 36.84% put waste into trash bin without segregation. 10.53% do not know the discharge method.

Table A.5.3-16 Manner of Discharge of Solid Waste

Discharge Method	No.	Percent
Put the solid waste into trash bin with segregation	69	51.88
Put the solid waste into trash bins without segregation	49	36.84
I don't know the discharge method.	14	10.53
Others, (Bring back to the hotel)	1	0.75
Total	133	100.00

Source: JICA Study Team

Majority (81 responses) of the respondents also opined that improvement should be emphasized on putting clear notices on trash bins. This was followed by the suggestion to consider the number and location of the trash bins (61 responses). Other suggestions on what points to improve are summarized in Table 5.3-17.

Table A.5.3-17 Points to Improve Solid Waste Discharge Methods

Points to Improve	No.*
Put some clear notice on the trash bins	81
Consider the shape of dust bins (specify: Bigger bins)	1
Consider the category of waste separation (specify, Maintain the 3 categories)	1
Consider the number and the location of the trash bins	61
Others (Color code trash bins)	2
Others (More and bigger trash bins, No bio waste at beach)	1
I have no view	3
Other, (Conduct regular monitoring for compliance)	5
Other, (Increase awareness through signage)	1
Other, (Regular time for waste collection)	1
Total	157

Source: JICA Study Team

Majority (63.91%) are not aware of the penalty imposed on improper solid waste discharge while (28.57%) are aware of the penalty but do not know the amount. The rest (7.52%) are aware of the penalty and amount.

Table A.5.3-18 Awareness on Penalty for Improper Solid Waste Discharge

Level of Awareness	No.	Percent
No, I don't know	85	63.91
Yes, I know and I know the amount of penalty	10	7.52
Yes, I know but I do not know the amount of penalty	38	28.57
Total	133	100.00

Source: JICA Study Team

5.3.4 Knowledge on Solid Waste Management and 3R activities (Reduce, Reuse, Recycle)

(1) Awareness of Discharge

Majority (63.16%) does not know the discharge method. Some 9.77% indicated that the source of information is by looking at the notice/label on the trash bins followed by those that were informed by hotel staff (8.27%). Other sources enumerated and respective percentages are shown in Table A.5.3-19.

Table A.5.3-19 Source of Information on Awareness of Penalty for Improper Discharge

Source of Information	No.	Percent
I don't know the discharge method	84	63.16
By looking at the notice/label on trash bins	13	9.77
Informed by hotel/resort staff	11	8.27
By watching it on cable TV	7	5.26
By reading local newspapers/newsletters	6	4.51
By looking at the poster in tricycles	2	1.50
By looking inside the trash bins	1	0.75
By looking at the poster in multi-cab	1	0.75
By listening to the radio	1	0.75
Others, (Poster along the road)	2	1.50
Others, (Informed by friends)	3	2.26
Others, (Common sense)	1	0.75
Others, (Attended local solid waste mgt program)	1	0.75
Total	133	94.74

Source: JICA Study Team

Majority (63%) of the respondents opined that there are few trash bins while 21.8% opined that the number of trash bins and allocation is sufficient. Some 5.26% said that the number of trash bins is sufficient but allocation should be improved. Of this percentage, four responses indicated that more trash bins should be placed at the beach. Some 6.77% do not have any view.

Table A.5.3-20 Opinion on the Present Provision of Trash Bins

Category	No.	Percent
Number of trash bins and the allocation is sufficient.	29	21.80
Number is sufficient but allocation should be improved Every resort in front should provide trash bins (1) More trash bins at the beach (4) Put in more areas where there are none (1) Put more trash bins with segregation inside hotels (1) Trash bins should be placed in area where visible and easily noticed (1)	7	5.26
Number of trash bins is too few.	85	63.91
Number of trash bins is too many		
Others (Specify Place more bins with design so that they will be more beautiful (1) I don't think it's bad to add trash bins as long as it's being used. (1) Put more trash bins rather than more garbage scattered everywhere (1)	3	2.26
I have no view.	9	6.77
Total	133	100.00

Source: JICA Study Team

(2) Waste Segregation

Majority (80 responses) of the respondents revealed that they prefer to practice segregation during discharge followed by bringing own shopping bag to avoid /reduce packaging (45 responses). Some respondents (33 responses) were willing to have a refund system for returnable bottles and containers while others (4 responses) prefer to collect the tin cans and

take it home for sale, reusing plastic bags for other purposes (3 responses). Some 8 responses indicated no view on the matter and the rest (1 response) is not willing to do anything.

Table A.5.3-21 Waste Reduction and Reuse Activity Willing to be Practiced

Activity	No.*
Bring own shopping bag to avoid/reduce packaging waste	45
Refund system for returnable bottles/containers	33
Practice segregation during waste discharge	80
Bring waste generated here to a place outside the island	2
Others (Specify)	4
Collect the tin cans and take it home to sell (1)	
Recycle plastic container (3)	
None	1
I have no view	8
Total	173

Source: JICA Study Team

(3) Awareness on Incentive System regarding Source Segregation

Regarding the willingness to pay for the plastic packaging, 25.56% of the respondents are not willing to pay. Those that are willing to pay (74.43%) mentioned varying amounts from the lowest of PhP0.25 to as high as PhP9.00. Of this, majority (22.56%) are willing to pay PhP2.00 for the plastic bag. The amounts cited by the rest are also presented in Table A.5.3-22.

Table A.5.3-22 Amount Willing to Pay for Plastic Bag

Amount (PhP)	No.	Percent
0	34	25.56
0.25	1	0.75
0.5	8	6.02
1	22	16.54
10	6	4.51
15	2	1.50
2	30	22.56
20	1	0.75
3	11	8.27
5	17	12.78
9	1	0.75
Total	133	100.00

Source: JICA Study Team

Table A.5.3-23 presents the course of action that the tourists will do in case the price of the plastic bag is greater than the amount they are willing to pay. While the majority of the tourists are willing to pay for the plastic bags as presented in the previous table, majority (41.35%) will just bring their own shopping bag. This is followed by tourists who are still willing to pay actual prices of the plastic bags (36.84%). Some 9.77% do not have any view at all while the rest have other responses (5.26%).

Table A.5.3-23 Action if Price of Plastic Bag Exceeds Amount Willing to Pay

Course of Action	No.	Percent
I will bring my own shopping bag.	55	41.35
I will pay actual prices of with my acceptance	49	36.84
I will stop buying the goods.	9	6.77
Others (Specify)		
Find another store	2	1.50
There should be no additional charge	5	3.76
I have no view.	13	9.77
Total	133	100.00

Source: JICA Study Team

Table A.5.3-24 presents the course of action of tourists if deposit/refund system is imposed on containers. 39.85% indicated that containers will be returned all the time. This is followed by tourists that mentioned that they will sometimes throw in trash bin and sometimes return containers to the shops/stores (27.07%). 21.05% indicated that they will sometimes throw in trash bin but more often return containers to the shops/stores and get the refund. The others will throw all the time (8.27%), have no view (3.01%) and will not return the containers if the deposit is cheap (0.75%)

Table A.5.3-24 Course of Action when Deposit/Refund Imposed on Containers

Course of Action	No.	Percent
Throw all the time	11	8.27
Sometimes throw in trash bin and sometimes return containers to the shops/stores	36	27.07
Sometimes throw in trash bin but more often return containers to the shops/stores	28	21.05
Always return containers to the shops/stores	53	39.85
Others, (Specify)		
If the deposit is cheap I won't return the containers. It is much better if the collected deposits imposed on containers will go to the project regarding environmental protection	1	0.75
I have no view	4	3.01
Total	133	100.00

Source: JICA Study Team

Expected amounts for the refund in containers are presented in Table A.5.3-25. Majority (25.56%) expect that refund for containers should be PhP5.00, while 18.05% are not expecting anything. Generally the respondents expect a refund for container deposits from PhP0.25 to PhP20.

Table A.5.3-25 Expected Refund for Deposit for Containers

Amount (PhP)	No.	Percent
0	24	18.05
0.25	1	0.75
0.5	4	3.01
1	15	11.28
2	18	13.53
2.5	1	0.75
3	10	7.52
4	1	0.75
5	34	25.56
6	1	0.75
7	6	4.51
8	1	0.75
10	13	9.77
15	3	2.26
20	1	0.75
Total	133	100.00

Source: JICA Study Team

(4) Awareness on Discharge Method

The willingness of tourists was interviewed to bring solid wastes to specific locations and these are presented in the succeeding Table A.5.3-26. Majority (98.5%) are willing to bring the wastes to designated trash bins. Also, most of the tourists (91.73%) are also willing to bring it back to the hotel/home. This is the most that they are willing to do. Other locations where solid wastes can be brought reflect that tourists are not generally willing as evidenced by percentage responses on bringing waste to collection points within the island (61.65% not willing), junk shops within the island (80.45% not willing) and waste collection points outside the island (88.72% not willing).

Table A.5.3-26 Willingness to Bring Waste to Designated Disposal Areas

Location	Yes		No		Total	
	Num.	Percent	Num.	Percent	Num.	Percent
Designated trash bins	131	98.50	2	1.5	133	100.00
Hotel/home	122	91.73	11	8.27	133	100.00
Waste collection points within the island	51	38.35	82	61.65	133	100.00
Junk shops within the island	26	19.55	107	80.45	133	100.00
Waste collection point outside the island	15	11.28	118	88.72	133	100.00

Source: JICA Study Team

5.3.5 Awareness on Financial Instrument to Protect Environment and to Improve Solid Waste Management

(1) Payment of Environmental Admission Fee

Majority of the tourists (57.14%) are aware of the charging of the environmental and admission fee. The rest are not aware (42.86%). However, this does not mean that this fee was not paid since many tourists are part of tour groups that have package deals.

Table A.5.3-27 Awareness on Charging of Environmental and Admission Fee

Awareness	No.	Percent
Aware	76	57.14
Not Aware	57	42.86
Total	133	100.00

Source: JICA Study Team

Of the tourists that are aware of the environmental and admission fee, only 48.12% know the amount that was paid. Majority (51.88%) was aware of the fee but did not know the amount as shown in Table A.5.3-28.

Table A.5.3-28 Awareness on Amount of Environmental and Admission Fee

Awareness	No.	Percent
Aware	64	48.12
Not Aware	69	51.88
Total	133	100.00

Source: JICA Study Team

Tourists that were aware of the environmental and admission fee and the amount comprise about half (50.38%) while the rest (49.62%) do not know the amount.

Table A.5.3-29 Number of Tourists that are Aware of P50.00 Amount

Awareness	No.	Percent
Aware	67	50.38
Not Aware	66	49.62
Total	133	100.00

Source: JICA Study Team

With regard to the opinion of respondents on the amount the environmental and admission fee of PhP50, majority (72.18%) indicated that the amount is suitable while 18.8% think that the fee is too much. On the other hand, some 3.01% said that it is too small. The rest (6.02%) do not have a view.

Table A.5.3-30 Opinion on P50.00 Environmental and Admission Fee

Opinion	No.	Percent
I think it is suitable	96	72.18
I think it is too much	25	18.80
I think it is too small	4	3.01
I have no view	8	6.02
Total	133	100.00

Source: JICA Study Team

Of those that responded that the fee is too much, some 44% indicated that the appropriate fee should be PhP20 followed by those that indicated PhP30 (20%). The rest mentioned varying amounts based on their preference as shown in Table A.5.3-31.

Table A.5.3-31 Suitable Amount if Environmental Admission Fee is Too Much

Amount (PhP)	Num.	Percent
2	1	4
10	4	16
15	1	4
20	11	44
25	3	12
30	5	20
Total	25	100

Source: JICA Study Team

Respondent who indicated that the fee is too small suggested two amounts as the suitable fee. Of these, majority suggested PhP100 (75% or 3 respondents) and PhP75 (25% or 1 respondent).

Table A.5.3-32 Suitable Amount if Environmental Admission Fee is Too Small

Amount (PhP)	Num.	Percent
75	1	25.00
100	3	75.00
Total	4	100.00

Source: JICA Study Team

Willingness to pay the environmental and admission fee based on the duration of stay in the island revealed that the majority of respondents are not willing as indicated by 49.62% of the tourists. Almost half (42.11%) indicated that they are willing to pay based on the duration of their stay. The rest (8.27%) have no view.

Table A.5.3-33 Willingness to Pay on Duration-based Environmental and Admission Fee

Opinion	Num.	Percent
No	66	49.62
Yes	56	42.11
I have no view	11	8.27
Total	133	100.00

Source: JICA Study Team

Those who indicated unwillingness to pay cited several reasons. Majority (29.87%) indicated that it is not clear to them how the government will use the funds. This was followed by the reason of not understanding the background condition or assumption as mentioned by 14.29% of the respondents. Also, some 16.88% mentioned the reason that they are not willing since the total required amount of financing environmental protection is not clear. Other reasons cited by the tourists are presented in Table A.5.3-34 below.

Table A.5.3-34 Reason Why Not Willing to Pay based on Duration of Stay

Reason	No.	Percent
I cannot afford	5	6.49
I don't feel the value of protection of environment of Boracay Island	5	6.49
Total required amount of finance for environmental protection is not clear	13	16.88
I cannot understand the background condition or assumption	11	14.29
It is government's responsibility to protect environment and budget for it	6	7.79
It is not clear how government will use the funds	23	29.87
Others (specify)	3	3.90
I have no view	11	14.29
Total	77	100.00

Source: JICA Study Team

(2) Payment Procedure

Those that are willing to pay based on the duration of stay cited the manner by which they will pay the fee. Majority (53.37%) selected government collectors as currently practiced followed by 23.21% of the tourists who choose to pay through the transport fares and 19.64% who choose to pay through the accommodation fee in the hotel. The rest (3.57%) are willing to pay through the restaurants. None of the tourists are willing to pay through the goods bought in the souvenir shop.

Table A.5.3-35 Manner of Payment for Environmental and Admission Fee

Manner of Payment	Num.	Percent
Through government collectors as currently practiced	30	53.57
Through transport fares	13	23.21
Through accommodation fee in hotel	11	19.64
Through charge for food or drink in restaurant	2	3.57
Through the goods in souvenir shop	0	-
Total	56	100.00

Source: JICA Study Team

(3) Opinion on Solid Waste Management

With regard to the opinion of the respondents on SWM, the most common comment is the need to increase/improve trash bins around the island especially at the beach (31 responses). This was the most common comment heard from the tourists during the interviews that were conducted. An ocular survey of the beach confirmed the lack of very minimal trash bins on the beach front. In the few places where there are trash bins, these are mostly the initiative of the hotels or resorts that operate there. Although, the Municipality of Malay is very clear on this (Section 2, Municipal Ordinance No. 84, S. 1995), compliance may be very minimal. Hence, compliance should be strictly enforced.

This was followed by the suggestion to increase awareness on solid waste management (23 responses). There is very low awareness particularly on waste segregation as evidenced by majority who said that they do not know the discharge method. This is a very critical step in the solid waste management program of the municipality since the volume of tourists that

visit the island every year is monumental. For 2006, tourist arrivals reached the half a million mark.

The next most common suggestion is the regular clean-up at the beach (21 responses). Most of the tourists (48 responses) are willing to participate in clean-up activities at the beach and at various levels. This is the second most common activity that they are willing to do. This must be incorporated into any future plan that might involve clean-up activities for designed for tourists.

Compliance to solid waste management policies as embodied in the various ordinances should be strictly enforced/monitored (15 responses). Although there is high compliance among tourists with regard to waste segregation (51.88%), a considerable number of tourists (36.84%) still discharge solid waste without segregation.

Other responses mentioned with regard to solid waste are presented in Table A.5.3-36 below.

Table A.5.3-36 Opinion on Solid Waste Management

Opinion	Num.
Increase/Improve trash bins around the island	31
Increase awareness on SWM	23
Regular clean-up at the beach	21
Regular monitoring for compliance on SWM	15
I see no problems/SWM implementation is ok	14
Observe proper disposal of solid wastes	13
Hire people to maintain cleanliness at the beach	11
All should participate in clean-up activities	4
No idea	4
Environment should be protected as a whole	4
Regulate construction activities in the island	4
Practice 3R Activities	4
Discourage use of plastic bags	2
SWM fund should come from tax of business/terminal fees	2
Transparency in where the fees go	1
Total	0

Source: JICA Study Team

Appendix

Questionnaire for Residents

Master Plan for Solid Waste Management in the Municipality of Malay and Boracay Island

Public Awareness Survey

Questionnaire for Residents

Sample Number _____

Date of Interview: ___ / ___ / 2007

Name of Interviewer: _____

Name of Respondent: _____

Position in the Household: _____ (e.g. household head, spouse, son, daughter, etc.)

Barangay: _____ Municipality: _____ Province: _____

Section 1. Household Information

Q1 Number of Dependents: _____

Q2 Household members in the same house INCLUDING the respondent and temporal absentees.

	Name of Household Member	Sex (M/F)	Age	Education Attained	Main Occupation	Relationship to respondent
1	RESPONDENT					RESPONDENT
2						
3						
4						
5						
6						
7						
8						
9						
10						

Code for education:

NE - No formal education

PR - Preschool

EU - Elementary undergraduate (Grades 1 to 5)

EG - Elementary graduate (Grade 6)

HU - High school undergraduate (1st yr to 3rd yr)

HG - High school graduate (4th year)

CU - College undergraduate (1st yr to 3rd or 4th yr)

CG - College graduate

PG - Post-graduate

V - Vocational

Code for occupation:

FA - Farmer/Fisherfolk

PO - Public official (specify: _____)

SW - Salary worker (specify: _____)

WW - Daily wage worker (specify: _____)

PB - Private business (specify: _____)

ST - Student

CH - Child (below school age)

PR - Pension receiver

N J - No job (including house keeping)

RN - Retired with no Pension

Q3 Major income sources of the household (Please indicate the annual income for each source, and then give us your order of importance: 1, 2, 3...)

Income Source Items	Annual Income (Peso) (A)	Importance (B)
1. Selling agricultural & fisheries products (specify: _____)		
2. Salary & wage from permanent job (specify: _____)		
3. Remittance from family member (specify: _____)		
4. Private business (specify: _____)		
5. Others (specify: _____)		

Q4 Total annual household income

A. Agricultural & fisheries income (1) Peso _____ / year

B. Other income (2+3+4+5) Peso _____ / year

Total Income [A + B here in Q4] **Peso** _____ / year

Q5 Housing Materials

- 1 Light-made materials (e.g., bamboo and nipa)
- 2 Hardwood-made
- 3 Semi-concrete made (combination of wood and concrete)
- 4 Concrete-made
- 5 Others (specify): _____

Q6 Ownership of the land where your house is built

- 1 Owned 2 Rented 3 Rent-free occupant

Q7 Ownership of the house

- 1 Owned 2 Rented 3 Rent-free occupant

Q8 Total floor area of the house: _____square meters

Q9 Total area of the yard/garden: _____square meters

Q10 What are the major sources of information in your household? (Multiple answers allowed)

- | | |
|------------------------|----------------------------|
| 1 Television | 5 Government Announcements |
| 2 Radio | 6 NGOs / CBOs |
| 3 Newspapers/Magazines | 7 Neighbors |
| 4 Pamphlets/Posters | 8 Others (specify: _____) |

Section 2. Environment and Solid Waste Concerns

Q11 What do you think of the cleanliness in your house and surrounding area?

- 1 I don't think that it is so clean.
- 2 I think that it is clean but not enough to be proud of.
- 3 I think that it is too clean to be proud of.
- 4 I have no idea.

Q12 Does your house and your surroundings have any problem caused by solid waste? (Multiple answers allowed)

- 1 Littering wastes anywhere
- 2 Dumping of waste anywhere and not in designated collection points
- 3 Scattering trash in waste collection points
- 4 Offensive odor from surrounding waste treatment, disposal facility and collection points
- 5 Insects, pests, worms or animals proliferate due to scattering solid waste
- 6 Contamination or pollution of water or water sources by leachate from dumping site, other solid waste treatment facilities and solid waste in street
- 7 Degradation of landscape due to solid waste treatment, disposal facility and solid waste on roadside
- 8 Burning of municipal waste
- 9 Others (Specify _____)
10. No, I don't.

Q13 How do you keep your house and surrounding environment clean? (Multiple answers allowed)

- 1 Clean around my house only
- 2 Practice waste segregation
- 2 Discharge waste at the designated time and place
- 3 Participate in voluntary cleaning activities
- 4 Educate my family to keep house and surrounding clean
- 5 Others (Specify _____)
- 6 None

Section 3. Knowledge on Solid Waste Management and 3R activities (Reduce, Reuse, Recycle)

Q14 Are you aware of the Ordinance on Solid Waste Management of the Municipality of Malay?

- 1 Yes 2 No 3 No Idea

Are you aware of the following policies on solid waste management?

- | | | | | | |
|------------|--|---|-----|---|----|
| Q15 | Date/day of solid waste collection in your area? | 1 | Yes | 2 | No |
| Q16 | Time to discharge solid waste | 1 | Yes | 2 | No |
| Q17 | Place to discharge solid waste | 1 | Yes | 2 | No |
| Q18 | Category of segregation when solid waste is discharged | 1 | Yes | 2 | No |
| Q19 | Others (Specify _____) | 1 | Yes | 2 | No |

Q20 Barangays collect solid waste with segregation. How should you adhere with segregation according to Malay Municipality Ordinance. (select one)

- 1 All waste should be mixed and without segregation.
- 2 Only recyclables should be separated from other wastes.
- 3 Only food waste and recyclables should be separated from other wastes.
- 4 Recyclables should not be collected but other wastes must be collected.
- 5 I don't know how to segregate.

Q21 How did you get the knowledge of the discharge methods?

- | | |
|---|---|
| 1 Poster in tricycles | 8 Instruction from barangay monitoring team |
| 2 Poster in multicab | 9 Newspapers/newsletters |
| 3 Poster in pump boat | 10 Radio |
| 4 Heard in the neighborhood | 11 TV |
| 5 Dissemination meeting by municipality | 12 Internet |
| 6 Dissemination meeting by barangay | 13 Others (Specify _____) |
| 7 Dissemination meeting by NGO/CBO | 14 I don't know the discharge method |

Section 4. Waste Discharge Activities

Q22 How do you dispose and discharge each waste item? (Check all applicable answers)

Waste Type	Bury the waste by myself	Burn the waste by myself	Feed animals	Compost	Sell to Buyer	Discharge to public service with segregation	Discharge to public service without segregation	Others (private, etc)
Q22A Food waste								
Q22B News paper/ Magazine/ Books, Cartons			-	-				
Q22C Glass Bottle			-	-				
Q22D Cans			-	-				
Q22E PET bottles			-	-				
Q22F Other plastics (Styrene form, bottles excl. PET bottle)			-	-				
Q22G Construction waste			-	-				
Q22H Hazardous waste (batteries, bulbs, paints, chemicals, expired drugs, etc)			-	-				
Q22I Other wastes			-	-				

Q23 In case you of avail collection service, how frequently do you discharge solid waste? If you use for solid waste discharge, how do you pack solid waste to discharge with the plastic bag? (Show the sample garbage bags for reference in size used)

Waste Type	Frequency of discharge	Number of bags to discharge waste	Size of the plastic bag	Price of the plastic bag
			Small = ___kg Medium = ___kg Large = ___kg	
Food waste	_____ Times/week	_____ bags/time	[S] ___ Size/piece [M] ___ Size/piece [L] ___ Size/piece	_____ Peso/piece _____ Peso/piece _____ Peso/piece
Recyclables	_____ Times/week	_____ bags/time	[S] ___ Size/piece [M] ___ Size/piece [L] ___ Size/piece	_____ Peso/piece _____ Peso/piece _____ Peso/piece
Residual waste	_____ Times/week	_____ bags/time	[S] ___ Size/piece [M] ___ Size/piece [L] ___ Size/piece	_____ Peso/piece _____ Peso/piece _____ Peso/piece

Q24 Storage Capability and Discharge Methods

Waste Type	How many days can you keep the waste in household?	How far from your household can you discharge?	How much can you pay for the plastic bag for waste discharge monthly?
Food waste	_____ days	_____ meters	_____ Peso/month
Recyclables	_____ days	_____ meters	
Residual waste	_____ days	_____ meters	

Q25 How much do you implement following 3R activities (Reduce, Re-Use, Recycle) waste in your house? (Check one in each activity)

3R Activity Type		I don't do it at all	I sometimes do it	I often do it (sometimes don't do it)	I do it every time
25a	Reduce kitchen waste in cooking process as much as possible.				
25b	Repair and Reuse it when something is broken.				
25c	I bring my own bag to reduce waste when I go shopping.				
25d	I use kitchen waste (peelings, etc. to feed animals/pets				
25e	I use kitchen waste to make compost				
25f	I segregate recyclables and sell to buyer				

Section 5. Opinion of Current Public Collection Service

Q26 Are you satisfied with current public collection service? (Select one)

- 1 I am very satisfied. → proceed to Q27a
- 2 I am a little satisfied → proceed to Q27a
- 3 I am not satisfied at all → proceed to Q27b

- 4 No opinion → proceed to Q28

Q27a What aspect are you satisfied with? (To be answered by respondent that selected 1 or 2 in "Q26") (Encircle appropriate answers)

- 1 Collection time is done on schedule.
- 2 Collection frequency is often.
- 3 Segregation at our house is actively done.
- 4 It is easy to understand what item should be separated.
- 5 Instruction for source separation is not that strict and easy to comply.
- 6 Others (Specify _____)

Q27b What aspect are you not satisfied with? (To be answered by respondent that selected 3 in "Q26") (Encircle appropriate answers)

- 1 Collection time is too early to discharge waste.
- 2 Collection frequency is few.
- 3 Segregation at our house is an additional burden and too laborious for us.
- 4 It is not easy to understand what item should be separated.
- 5 Instruction for source separation is very strict.
- 6 Others (Specify _____)

Q28 Please give your honest opinion for each system in the current public collection service of waste (To be answered by all respondents).

28a Time to be discharged (collection time)

- 1 Keep it as is
- 2 Change the schedule to (___:___)

28b Food Waste Collection Frequency

- 1 Keep it as is
- 2 Increase collection frequency to (___ times / week)
- 3 Reduce the collection frequency (___ times / week)

28c Recyclables Collection Frequency

- 1 Keep it as is
- 2 Increase collection frequency to (___ times / week)
- 3 Reduce the collection frequency (___ times / week)

28d Residual Wastes Collection Frequency

- 1 Keep it as is
- 2 Increase collection frequency to (___ times / week)
- 3 Reduce the collection frequency (___ times / week)

28e Number of Source Separation Categories (Food Waste, Recyclables and Residual Wastes)

- 1 Keep it as is
- 2 Reduce it. What category should be removed and combined with another category?
(specify combination: _____)
- 3 Increase it. How many categories are acceptable? _____ categories

Section 6. Willingness to Pay for Waste Collection

Explain to the respondent: The proper implementation of solid waste management would require many actions and activities such as waste segregation at the source level, frequent collection of waste, proper treatment and disposal.

Q29 If the municipality introduce waste collection fee charging system for household, are you willing to pay for the waste management services?

- 1 Yes → proceed to Q30
- 2 No → proceed to Q31

Q30 How much fee are you willing to pay for waste management services? (For respondents that selected "1" in "Q29")

	Peso/month
--	------------

->proceed to Q32

Q31 Why are you not willing to pay for waste management services? (For respondents that selected "2" in "Q29")

- 1 Because I cannot afford the payment
- 2 Because municipality has the responsibility for public service.
- 3 Business sectors or tourists have much more responsibility due to much generator of solid waste
- 4 Current waste collection service is not so good
- 5 Others (Specify _____)

Q32 If public collection service is improved in the future, how much fee are you willing to pay for it?

	Peso/month
--	------------

Q33 Please give your honest opinion or idea related to waste management if any.

Thank you very much!

Questionnaire for Business Establishments

**Master Plan for Solid Waste Management in the Municipality of Malay
and Boracay Island**

Public Awareness Survey

Questionnaire for Business Establishment

Sample Number _____

Date of Interview: ___ / ___ / 2007

Name of Interviewer: _____

Section 1. General Information

Q1	Name of Business Establishment	
Q2	Address	Barangay _____
Q3		Municipality _____
Q4		Province _____
Q5	Contact Information	Telephone _____
Q6		Fax _____
Q7		Email _____
Q8	Establishment Type	1 Hotel 2 Restaurant 3 Hotel and Restaurant 4 Small Shop (food, daily sundries, souvenirs) 5 Public Facility 6 Others (Specify _____)
Q9	Year Established	
Q10	Number of Employees	
Q11	Total Floor Area (m ²)	
Q12	Annual Turnover / Gross Income (PHP)	
Q13	Estimated Capital (PHP)	
Q14	Number of Guest Rooms (hotels and accommodation establishment)	
Q15	Occupancy Rate	a. Peak Season : _____ % b. Off Season : _____ %
Q16	Number of Tables (restaurants and eating/drinking places)	

Section 2. Respondent Information

Q17	Name	
Q18	Position	1 Manager 2 Deputy manager 3 Section manager 4 Technical staff 5 Other permanent staff(Specify _____)
Q19	Sex	1 Female 2 Male
Q20	Age	1 Less than 20 2 20-39 year-old 3 40-59 year-old 4 More than 60 year-old

Section 3. Environment and Solid Waste Concerns

Q21 What do you think of the cleanliness in your business establishment? (Select one)

- 1 I don't think that it is so clean.
- 2 I think that it is clean but not enough to be proud of.
- 3 I think that it is very clean and something to be proud of.
- 4 I have no view.

Q22 What does your business do to keep your surrounding environment clean? (Select any)

- 1 Clean around our business establishment only
- 2 Segregate solid waste
- 3 Participate in voluntary clean-up activities
- 4 Train / Teach our staff to maintain cleanliness
- 5 Other activities (Specify _____)
- 6 None

Q23 Does your business establishment have any problem caused by solid waste? (Select any)

- 1 Indiscriminate throwing of solid waste anywhere
- 2 Scattering waste in waste collection points
- 3 Foul odor from surrounding waste treatment and disposal facility
- 4 Insect, pest, worms or animal proliferation due to scattering solid waste
- 5 Contamination or pollution of water or water source by leachate from dumping site or other solid waste treatment facilities
- 6 Degradation of landscape due to solid waste treatment and disposal facility
- 7 Others (Specify _____)
- 8 None

Section 4. Knowledge Regarding Solid Waste Management and 3R activities (Reduce, Reuse, Recycle)

Q24 Does your business establishment encounter problems in the public waste collection service (Encircle one)?

- 1 Yes 2 No 3 No Idea

Are you aware of the following policies on solid waste management?

Q25	Date/day of solid waste collection in your area?	1	Yes	2	No
Q26	Time to discharge solid waste	1	Yes	2	No
Q27	Place to discharge solid waste	1	Yes	2	No
Q28	Classification of segregated solid wastes upon discharge	1	Yes	2	No
Q29	Others (Specify _____)	1	Yes	2	No

Q30 Sources of Information on Solid Waste Management (Encircle all applicable answers)

- | | |
|------------------------|----------------------------|
| 1 Television | 5 Government Announcements |
| 2 Radio | 6 NGOs / CBOs |
| 3 Newspapers/Magazines | 7 Neighbors |
| 4 Pamphlets/Posters | 8 Others (specify _____) |

Q31 Each Barangay collects solid waste with segregation. How should your business establishment adhere with segregation according to Malay Municipality ordinance (select one)

- 1 All waste should be mixed and without segregation.
- 2 Only food waste should be separated and discharged from other waste.
- 3 Only recyclables should be separated from other waste.
- 4 Only food waste and recyclables should be separated from other waste.
- 5 Recyclables should not be collected but other waste must be collected.
- 6 I don't know how to segregate.

Section 5. Waste Discharge Activities

Q32 How does your business establishment dispose and discharge each waste item? (Check all applicable answers)

	Waste Type	Bury the solid waste by myself	Burn the solid waste by myself	Feed to animal	Compost	Sell to Buyer	Discharge (Public service w/ separation)	Discharge (Public service w/o separation)	Others (specify)
Q32A	Food waste								
Q32B	News paper/ Magazine/ Books, Kartons			-	-				
Q32C	Glass Bottle			-	-				
Q32D	Cans			-	-				
Q32E	PET bottles			-	-				
Q32F	Other plastics (Styrene form, bottles excl. PET bottle)			-	-				
Q32G	Construction waste			-	-				
Q32H	Hazardous Waste (batteries, bulbs, paints, chemicals, expired drugs, etc)			-	-				
Q32I	Other wastes (specify)			-	-				

Q33 In case of your business establishment utilizes public waste collection service how many times do your business establishment discharge solid waste? If your business establishment use plastic for solid waste discharge, how does your business establishment pack solid waste to discharge with the plastic bag? (Show the sample garbage bags for reference in size used)

Waste Type	Frequency of discharge	Number of bags to discharge waste	Size of the plastic bag Small = __kg Medium = __kg Large = __kg	Price of the plastic bag
Food waste	___ Times/week	___ Bags/time	[S] ___ Size/piece [M] ___ Size/piece [L] ___ Size/piece	___ Peso/piece ___ Peso/piece ___ Peso/piece
Recyclables	___ Times/week	___ Bags/time	[S] ___ Size/piece [M] ___ Size/piece [L] ___ Size/piece	___ Peso/piece ___ Peso/piece ___ Peso/piece
Residual waste	___ Times/week	___ Bags/time	[S] ___ Size/piece [M] ___ Size/piece [L] ___ Size/piece	___ Peso/piece ___ Peso/piece ___ Peso/piece

Q34 Storage Capability and Discharge Method

Waste Type	How many days can you keep the waste in your area?	How far from your area can you carry waste to discharge?	How much can you pay for the plastic bags/container for waste discharge monthly
Food waste	___ days	___ meters	___ Peso/month
Recyclables	___ days	___ meters	
Residual waste	___ days	___ meters	

Q35 How much does your business establishment implement following 3R activities (Reduce, Re-use, Recycle) for waste? (Check one in each activity)

3R Activity Type		Don't do it at all	Sometimes do it	Often do it (sometimes don't do it)	All the time
Q34a	Our staff reduce kitchen waste in cooking process as much as possible.				
Q34b	Our staff use kitchen waste to feed animals/pets.				
Q34c	Our staff use kitchen waste to make compost				
Q34d	Our business fixes/repairs broken things and reuses them.				

Section 6. Opinion of Current Public Collection Service

Q36 Is your business establishment satisfied with current public collection service? (Select one)

- | | |
|-----------------------------|-------------------|
| 1 I am very satisfied. | → proceed to Q37a |
| 2 I am a little satisfied | → proceed to Q37a |
| 3 I am not satisfied at all | → proceed to Q37b |
| 4 No opinion | → proceed to Q38 |

**Q37a What aspect are you satisfied with? (To be answered by respondent that selected 1 or 2 in “Q36”)
(Encircle appropriate answers)**

- 1 Collection time is done on schedule.
- 2 Collection frequency is often.
- 3 Segregation at source is actively done by our business establishment.
- 4 It is easy to understand what item should be separated.
- 5 Instruction for source separation is not that strict and easy to comply.
- 6 Others (Specify _____)

**Q37b What aspect are you not satisfied with? (To be answered by respondent that selected 3 in “Q36”)
(Encircle appropriate answers)**

- 1 Collection time is too early to discharge waste.
- 2 Collection frequency is few.
- 3 Segregation at source is burdensome for our business establishment.
- 4 It is not easy to understand what item should be separated.
- 5 Instruction (or **Compliance monitoring**) for source separation is very strict.
- 6 Others (Specify _____)

**Q38 Please give your honest opinion for each system in the current public collection service of waste
(To be answered by all respondents).**

38a Time to be discharged (collection time)

- 1 Keep it as is
- 2 Change the schedule to (___ : ___)

38b Food Waste Collection Frequency

- 1 Keep it as is
- 2 Increase collection frequency to (___ times / week)
- 3 Reduce the collection frequency (___ times / week)

38c Recyclables Collection Frequency

- 1 Keep it as is
- 2 Increase collection frequency to (___ times / week)
- 3 Reduce the collection frequency (___ times / week)

38d Residual Wastes Collection Frequency

- 1 Keep it as is
- 2 Increase collection frequency to (___ times / week)
- 3 Reduce the collection frequency (___ times / week)

38e Number of Source Segregation Categories (Biodegradable Waste, Recyclables and Residual Wastes)

- 1 Keep it as is
- 2 Reduce it. What category should be removed and combined with another category?
(specify combination: _____)
- 3 Increase it. How many categories are acceptable? _____ categories

Questionnaire for Tourists

**Master Plan for Solid Waste Management in the Municipality of Malay
and Boracay Island**

Public Awareness Survey

Questionnaire for Tourists

Sample Number _____

Date of Interview: ___ / ___ / 2007

Name of Interviewer: _____

Section 1. General Information

Q1	Country of Origin	Philippines: Province: _____ Country: _____
Q2	Sex	1 Male 2 Female
Q3	Age: _____ years old or--->	1 Under 10 year-old 2 10 - 19 year-old 3 20 - 39 year-old 4 40 - 59 year-old 5 Over 60 year-old
Q4	Occupation	1 Farmer/Fisherfolk 2 Company Employee 3 Owner executive 4 Government Employee 5 Independent business (incl. Shop owner) 6 Housewife 7 Student 8 Temporary worker (Except student) 9 Unemployed 10 Others, (Specify _____)
Q5	Highest Educational Attainment	1 Primary school 2 Junior secondary school 3 Senior secondary school 4 University (Bachelor or College degree) 5 Graduate school (Masters degree) 6 Graduate school (Doctorate degree) 7 Others, (Specify _____)
Q6	What is the purpose of your visit?	1 Do marine sports 2 Relax in Beach 3 Visiting acquaintance 4 Check prospects for business 5 Do business transaction 6 Others, (Specify _____)
Q7	How many times have you visited here?	1 First time 2 Second time 3 Third time 4 More than 3 times
Q8	How many days are you staying?	Philippines _____ days (total month) Panay Island _____ days Boracay Island _____ days
Q9	Which hotel/resort are you staying in?	_____
Q10	How much is the room rate?	_____ PHP or US\$ /day

Section 2. Perception and Awareness on Environment and Solid Waste

Q11 What do you think about the cleanliness of Boracay Island compared to your expectation? (Encircle one)

- 1 I don't think it is clean.
- 2 I think it is clean.
- 3 I have no view.

Q12 Do you think that tourists should keep the environment clean for the future of Boracay Island? (Encircle one)

- 1 Yes
- 2 No
- 3 No Opinion

Q13 What kind of activities are you willing to do to keep the environment clean now and in the future? (Multiple answers allowed)

- 1 Tourists should participate in waste reduction program
- 2 Tourists should participate in cleaning activities in various levels
- 3 Tourists should reduce solid waste generation
- 4 Tourists should bring back their waste to main island
- 5 Tourists should pay a fee for the beautification of the island and improvement of Solid Waste Management services
- 6 None
- 7 Others, Specify (_____)
- 8 I have no view.

Section 3. Awareness and Opinion on Solid Waste Discharge

Q14 Are you aware that there is a way of waste segregation and discharge in the island & Malay? If so, how did you become aware of it? (Encircle one)

- 1 By looking at the poster in tricycles
- 2 By looking at the poster in multicab
- 3 By looking at the poster in pump boat
- 4 By looking at the notice/label on trash bins
- 5 By looking inside the trash bins
- 6 By reading local newspapers/newsletters
- 7 By watching it on cable TV
- 8 By listening to the radio
- 9 Informed by hotel/resort staff
- 10 Others (Specify_____)
- 11 I don't know the discharge method

Q15 How do you discharge solid waste here? (Encircle one)

- 1 Put the solid waste into trash bins without segregation
- 2 Put the solid waste into trash bin with segregation
- 3 Others (specify: _____)
- 4 I don't know the discharge method.

Q16 Do you think there are some points to be improved about solid waste discharge

methods? (Multiple answers allowed)

- 1 Put some clear notice on the trash bins
- 2 Consider the shape of dust bins (specify: _____)
- 3 Consider the category of waste separation (specify: _____)
- 4 Consider the number and the location of the trash bins
- 5 Others (Specify _____)
- 6 I have no view.

Q17 Do you know you could be penalized or fined for improper discharge of solid waste in public spaces? (Encircle one)

- 1 Yes, I know but I do not know the amount of penalty.
- 2 Yes, I know and I know the amount of penalty.
- 3 No, I don't know.

Q18 How did you know that there is a penalty or fine for violation of waste management laws (Select one)

- | | |
|---|--------------------------------------|
| 1 By looking at the poster in tricycles | 7 By watching it on cable TV |
| 2 By looking at the poster in multicabs | 8 By listening to the radio |
| 3 By looking at the poster in pump boat | 9 Informed by hotel/resort staff |
| 4 By looking at the notice on trash bins | 10 Others (Specify_____) |
| 5 By looking at inside of trash bins | 11 I don't know the discharge method |
| 6 By reading local newspapers/newsletters | |

Q19 Increasing the number of trash bins affects the landscape. On the other hand, reducing the number of trash bins increases the burden for the tourists. In this context, how do you feel about the present provision of trash bins in Boracay Island? (Encircle one)

- 1 Number of trash bins and the allocation is sufficient.
- 2 Number of trash bins is sufficient but the allocation should be improved.
(Specify: _____)
- 3 Number of trash bins is too few.
- 4 Number of trash bins is too many.
- 5 Others (Specify _____)
- 6 I have no view.

Section 4. Knowledge on Solid Waste Management and 3R activities (Reduce, Reuse, Recycle)

Q20 What kind of waste reduction and reuse activities will you be willing to practice/adopt? (Multiple answers allowed)

- 1 Bringing your own shopping bag to avoid or reduce packaging waste.
- 2 Introduction of refund system for returnable bottles/containers.
- 3 Practice segregation during waste discharge.
- 4 Bringing the waste generated here to a place outside the island.
- 5 Others (Specify _____)
- 6 None
- 7 I have no view.

Q21 If stores start selling the plastic bag for packing the goods you buy instead of getting it for free, how much will you be willing to pay?

	Peso/bag
--	----------

Q22 If actual price of the plastic bag is more than the price of "Q19", what will you do? (Encircle one)

- 1 I will bring my own shopping bag.
- 2 I will pay actual prices of "Q19" with my acceptance.
- 3 I will stop buying the goods.
- 4 Others (Specify _____)
- 5 I have no view.

Q23 If there is a deposit/refund imposed on containers (e.g. glass bottles, aluminum cans, plastic bottles and cans), what would you do? (Encircle one)

- 1 Throw all the time.
- 2 Sometimes throw in trash bin and sometimes return containers to the shops/stores.
- 3 Sometimes throw in trash bin but more often return containers to the shops/stores.
- 4 Always return containers to the shops/stores
- 5 Others (Specify _____)
- 6 I have no view.

Q24 How much do you expect if you return the empty container?

	Peso/container
--	----------------

Q31 Presently, Environmental & admission fee is paid by tourists per entry to Boracay Island. However, many tourists stay for a long time. Do you think the payment of these fees should be based on the duration of their stay in Boracay Island? (Encircle one)

- 1 Yes
- 2 No
- 3 I have no view.

Proceed to Question 32
Proceed to Question 34
Proceed to Question 34

Q32 In what manner should you pay for environmental fee? (Select any)

- 1 Through government collectors as currently practiced
- 2 Through transport fares
- 3 Through accommodation fee in hotel
- 4 Through charge for food or drink in restaurant
- 5 Through the goods in souvenir shop
- 6 Others (Specify _____)
- 7 I have no view.

Proceed to Question 34

Q33 If you select the answers of "2" or "3" for "Q31", what would be the reason why you are not willing to pay any amount for the aforementioned services?

- 1 I cannot afford.
- 2 I don't feel the value of protection of environment of Boracay Island.
- 3 Total required amount of finance for environmental protection is not clear.
- 4 I cannot understand the background condition or assumption.
- 5 It is government's responsibility to protect environment and budget for it
- 6 It is not clear how government will use the funds
- 7 Others (specify) _____

Q34 Please give your honest opinion or idea related to waste management if any.

Thank you very much!

Appendix II-A-2 Photos



Interview of Tourist at Boracay Island



Interview of Tourist at Boracay Island



Interview of Business Establishment (Vendor)
at Boracay Island



Interview of Business Establishment (Eatery) at Caticlan in the
Mainland of Malay



Interview of Resident at the Mainland of Malay



Interview of Resident at the Mainland of, Malay

**PART II: 10-YEAR SOLID WASTE
MANAGEMENT PLAN**

B: WASTE CHARACTERISTIC SURVEY

PART II-B: WASTE CHARACTERISTIC SURVEY

1 Introduction

In response to the request of the Government of the Philippines, the Master Plan on Solid Waste Management for Boracay Island and the Municipality of Malay has been conducted. In order to identify the current conditions regarding solid waste management (SWM), Waste Characteristic Survey consisting of Unit Generation Rate Survey, Solid Waste Quality Survey and Solid Waste Quantity Survey (the Survey) in the Municipality of Malay was conducted in the process of preparation of 10-year SWM Plan.

2 Objective of the Survey

The survey aimed to evaluate and examine current condition the quantity and quality of solid waste generated, collected, treated and disposed on Boracay Island and the Mainland of Malay.

- To grasp and understand the current conditions on quantity and quality of solid waste generated and collected on Boracay Island and the Mainland of Malay, and
- To provide information to help examining the essential characteristics and factors for formulating the 10-year SWM Plan, such as unit generation ratio and collection rate of waste.

3 Scope of Works

The scope of works have included the following items:

- a) Unit Generation Rate Survey
- b) Solid Waste Quality Survey
- c) Solid Waste Quantity Survey

4 Methodologies

4.1 Sampling Methods

The survey areas included Barangays Yapak, Balabag and Manoc-Manoc on Boracay Island and Barangay Caticlan and in which samples from Barangays Sambiray and Poblacion within the Municipality of Malay in Aklan Province. Sampling was carried out from households, hotels, restaurants, shops and market, institutions including schools and offices and hospitals and clinics. The survey was conducted on continuous ten days duration including four weekends. The number of respondents identified per source is shown on Table 4.1-1.

Table B.4.1-1 Distribution of Sampling Size for the Survey

Area	Resident				Business Establishment				
	Low	Middle	High	Total	Hotels	Restau- -rants	Shops/ Market	Institu- tion	Hospitals/ Clinic
Manoc- Manoc	19	20	1	40	3	3	4	5	2
Balabag	5	30	0	35	6	5	6	5	7
Yapak	8	7	0	15	1	2	0	0	0
Boracay Island	32	57	1	90	10	10	10	10	9
Caticlan	5	8	2	15	2	2	3	4	2
Sambiray	2	3	0	5	0	1	1	0	0
Poblacion	4	6	0	10	0	1	1	2	1
Mainland of Malay	11	17	2	30	2	4	5	6	3
Sub-Total	43	74	3	120	12	14	15	16	12
Total = 189									

Source: JICA Study Team

4.2 Measurement Method

4.2.1 Unit Generation Rate Survey

After selecting the sampling targets of residents and business sectors, transparent plastic bags and coded tying strings were delivered to the sampling targets. In the delivery, the sampling procedure was explained with explanation sheet for each sampling target.

Before the survey, all the waste generated or stored in each generation source was collected to prevent the mixture with the sample to be collected in the survey.

The plastic bags of waste generated in a day were collected by the collectors and transported to MRF. After all the waste has been unloaded, all wastes were weighed individually per source and the weights were recorded according to biodegradable, recyclable and residual wastes. The volume of the wastes was also measured.

4.2.2 Waste Quality Survey

As one of procedures for random sampling, quartering method was adopted. In the quartering process, the wastes were mixed by using shovel and piled up conically and divided into four using rope line. Two opposite quarters obtained as first sample were utilized for additional quartering and the other two quarters were discarded. The quartering process continued a few times until the quantity of the sample became about 20 to 25 kg. After that, waste was sorted into each type of waste as 23 physical compositions such as 1) food wastes excluding bone and shell, egg shell; 2) food waste (bone and shell, egg shell); 3) wood/grass/leaves; 4) animal waste; 5) recyclable paper (paper, carton, newspaper, magazines, etc.); 6) non-recyclable paper (tissue paper, cotton, wipes, tetra pack, cigarette, etc.); 7) paper diaper/napkins; 8) styrofoam; 9) PET bottles; 10) other recyclable plastic (other plastic bottle, straws, CD, etc.); 11) non-recyclable plastic (film bag, wrap or film of food or snack, doy packs, sachet); 12) transparent glass bottle; 13) color glass bottles; 14) other glasses (flat glasses and drinking

glasses); 15) steel cans, etc.; 16) aluminum cans, etc.; 17) other metals; 18) textile and other fibers; 19) leathers and rubber including tire; 20) bulky waste (old appliances, equipments, etc.); 21) ceramics/stone, cement, soil; 22) batteries and lamps bulbs; and 23) others. Each waste component was placed in a pre-weighted crate or garbage bag with labels. Items on every category were weighed and recorded. Volume per item was also recorded.

Representative samples of biodegradable wastes for each source were also obtained and send to CRL Environmental Corporation for the laboratory analysis of moisture content.

4.2.3 Waste Quantity Survey

All wastes collected were transported to their respective MRFs (Yapak MRF, Balabag MRF, Manoc-Manoc MRF and Caticlan MRF) by collection vehicles as normal collection and transportation activities. The waste were weighed and recorded by using a 60-kg capacity of weighing scale after unloading at each MRF. The main component and the source of the wastes collected were also being observed. The collected wastes were recorded for each collection vehicle and observed for 10 consecutive days including four weekends.

The weight and volume of recyclable, biodegradable and residual wastes were also recorded being sorted out from the collected wastes. Identification of the recorded recyclable wastes was also done in order to determine the exact quantity for each type of recyclable wastes. This was done for 10 consecutive days including four weekends as stated in the contract.

The landfilled or residual wastes were determined by deducting the combined weight of biodegradable wastes and recyclable wastes from the total collected wastes.

5 Results of the Waste Quality and Quantity Survey

5.1 Waste Quantity Survey

The unit generation ratio was determined in every source considering the number of persons generating the wastes based on the data stated in the attribution survey.

5.1.1 Waste from Household

There is no high income residential representative during the survey in Barangays Balabag and Yapak because some of them refuse to participate in the survey for being busy in their business and most of the time they are not at home and they will not able to generate the expected waste that belongs to high income group. The result of the waste generation survey is presented in Table B.5.1-1.

Table B.5.1-1 Results of Daily Waste Generation at Household

Area and Type of Household	Dry Season		Rainy Season		Average	
	Waste Generation per Person (kg/tourist/day)	Waste Generation per Person (kg/tourist/day)	Waste Generation per Person (kg/tourist/day)	Waste Generation per Person (kg/tourist/day)	Waste Generation per Person (kg/tourist/day)	Waste Generation per Person (kg/tourist/day)
Boracay Island	0.35	0.38	0.35	0.38	0.36	0.36
High Income	0.34	0.41	0.34	0.41	0.37	0.37
Middle Income	0.36	0.37	0.36	0.37	0.37	0.37
Low Income	0.34	0.35	0.34	0.35	0.35	0.35
Balabag	-	-	-	-	0.44	0.44
High Income	-	0.49	-	0.49	0.49	0.49
Middle Income	0.41	0.48	0.41	0.48	0.45	0.45
Low Income	0.40	0.41	0.40	0.41	0.41	0.41
Manoc-Manoc	-	-	-	-	0.33	0.33
High Income	0.34	0.33	0.34	0.33	0.34	0.34
Middle Income	0.34	0.33	0.34	0.33	0.34	0.34
Low Income	0.31	0.34	0.31	0.34	0.33	0.33
Yapak	-	-	-	-	0.32	0.32
High Income	-	-	-	-	-	-
Middle Income	0.33	0.33	0.33	0.33	0.33	0.33
Low Income	0.32	0.30	0.32	0.30	0.31	0.31
Mainland of Malay	0.33	0.34	0.33	0.34	0.33	0.33
High Income	0.35	0.34	0.35	0.34	0.35	0.35
Middle Income	0.35	0.34	0.35	0.34	0.35	0.35
Low Income	0.29	0.32	0.29	0.32	0.30	0.30

Source: JICA Study Team

The quantity of waste generation per person is 0.36 kg/person/day on Boracay Island, and is 0.33 kg/person/day on the Mainland of Malay. The difference of quantity of waste generation per person between rainy season and dry one is not so much. There is no significant difference on Boracay Island as well as on the Mainland of Malay.

5.1.2 Waste from Business Establishments

There are five sources of business establishments that considered in the survey, including hotel, restaurant, shop/market, institution and clinic/hospital.

Table B.5.1-2 Results of Daily Waste Generation at Hotel

Areas	Dry Season		Rainy Season		Average	
	Waste Generation	Waste Generation per Guest	Waste Generation	Waste Generation per Guest	Waste Generation	Waste Generation per Guest
	(kg/hotel/day)	(kg/tourist/day)	(kg/hotel/day)	(kg/tourist/day)	(kg/hotel/day)	(kg/tourist/day)
Boracay Island	15	0.40	16	0.39	15	0.40
Yapak	21.39	0.41	17.52	0.39	19.46	0.40
Balabag	6.95	0.41	5.30	0.40	6.13	0.40
Manoc-Manoc	15.53	0.40	25.77	0.20	20.65	0.40
Mainland of Malay	2.03	0.41	1.60	0.40	1.81	0.41

Source: JICA Study Team

As shown in Table B.5.1-2, the average waste generation per person in a hotel is 0.40 kg/person/day on Boracay Island during dry season and about 0.41 kg/person/day on the Mainland of Malay during dry season as well as rainy season. The quantity of waste generation per day in a hotel is 15 kg/hotel/day on Boracay Island while it is approximately 2 kg/hotel/day on the Mainland of Malay because the capacity of the hotel on the Mainland of Malay is smaller than on Boracay Island. The quantity of waste generation per hotel in dry season is more than in rainy season due to the seasonal fluctuation of tourist arrival.

Table B.5.1-3 Results of Daily Waste Generation of at Restaurant

Areas	Dry Season		Rainy Season		Average	
	Waste Generation	Waste Generation per Customer	Waste Generation	Waste Generation per Customer	Waste Generation	Waste Generation per Customer
	(kg/restaurant/day)	(kg/tourist/day)	(kg/restaurant/day)	(kg/tourist/day)	(kg/restaurant/day)	(kg/tourist/day)
Boracay Island	8.00	0.21	6.00	0.20	7.00	0.21
Yapak	6.47	0.21	5.37	0.20	5.92	0.21
Balabag	13.32	0.23	10.27	0.21	11.80	0.22
Manoc-Manoc	4.71	0.20	3.70	0.19	4.21	0.20
Mainland of Malay	2.46	0.20	7.58	0.21	5.02	0.21

Source: JICA Study Team

The restaurant in Barangay Balabag had the highest average waste generation per day on target barangays which is about 13.3 kg/restaurant/day. The reason will be that the barangay is the center of island wherein most of the tourists stayed. The average waste generation per restaurant on Boracay Island is 7.0 kg/restaurant/day with an average of 0.21 kg/person/day while on the Mainland of Malay, the restaurant there generated about 5 kg/restaurant/day with an average of 0.21 kg/person/day. The quantity of waste generation per restaurant in dry season is more than in rainy season due to the seasonal fluctuation of tourist arrival on Boracay Island. On the other hand, the fact that quantity of waste generation in rainy season is more than in dry one might be caused by the weight increase by rain or other factors.

Table B.5.1-4 Results of Daily Waste Generation at Shop/Market

Areas	(kg/shop/day)		
	Dry Season	Rainy Season	Average
Boracay Island	4.46	4.33	4.40
Yapak	-	-	-
Balabag	4.47	4.33	4.40
Manoc-Manoc	4.46	4.34	4.40
Mainland of Malay	4.64	4.36	4.40

Source: JICA Study Team

The average waste generation per shop is 4.40 kg/shop/day for shops/market on Boracay Island as well as on the Mainland of Malay. There are some differences in dry season and rainy one. Considering the degree of the differences, it will be in the range of the fluctuation.

Table B.5.1-5 Results of Daily Waste Generation at Institution

Areas	(kg/office/day)		
	Dry Season	Rainy Season	Average
Boracay Island	3.08	3.88	3.00
Yapak	-	-	-
Balabag	3.12	2.94	3.00
Manoc-Manoc	3.05	2.91	3.00
Mainland of Malay	3.13	2.88	3.01

Source: JICA Study Team

The average waste generation per institution is 3.00 kg/institution/day for institution on Boracay Island and 3.01 kg/institution/day as well as on the Mainland of Malay. There are some differences in dry season and rainy one. Considering the degree of the differences, it will be in the range of the fluctuation.

Table B.5.1-6 Results of Daily Domestic Waste Generation at Clinic/Hospital

Areas	(kg/hospital/day)		
	Dry Season	Rainy Season	Average
Boracay Island	1.65	1.01	1.32
Yapak	-	-	-
Balabag	1.88	1.04	1.50
Manoc-Manoc	1.68	0.98	1.32
Mainland of Malay	1.26	1.40	1.33

Source: JICA Study Team

The domestic waste generated from hospital on the Mainland of Malay was 1.32 kg/hospital/day similar to on Boracay Island which is 1.33 kg/hospital/day. Comparing the dry and rainy seasons, the quantity of waste generated in dry season was more than in rainy one on Boracay Island, but vice versa on the Mainland of Malay. It was considered to be impacts of tourists on Boracay Island but other factors such as infectious disease in rainy season cause the increase of the waste from hospitals.

5.2 Waste Quality Survey

5.2.1 Physical Composition

The physical composition of solid waste generated on Boracay Island is shown in Figure 5.2.1. The waste from hotels and restaurants includes the large quantity of biodegradable waste, while the waste from institutions does not generate a large quantity of biodegradable waste. Totally biodegradable, recyclable and residual wastes occupy the almost same portions of the total waste generation, i.e. 37 % of biodegradable, 35% of recyclable and 28% of residual waste respectively.

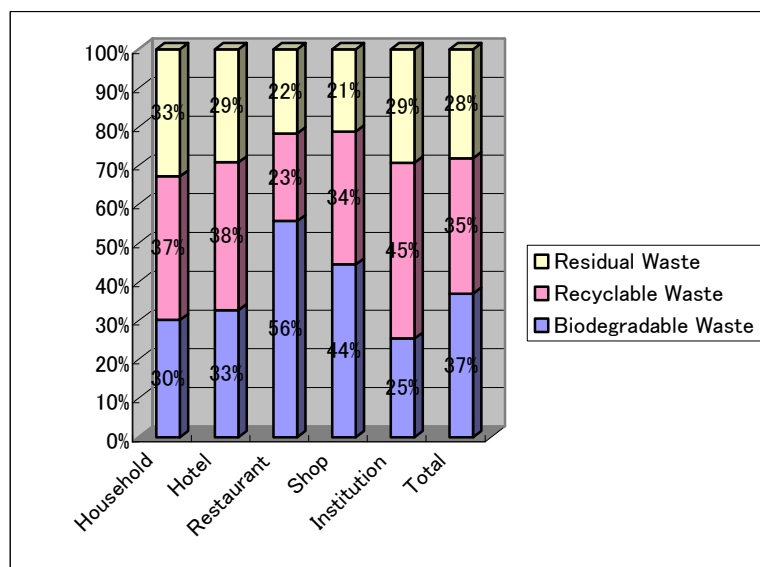


Figure B.5.2-1 Physical Composition of Waste Quality on Boracay Island

Note: The category of biodegradable includes food waste, wood/grass and animal waste

The category of recyclable includes recyclable paper, polystyrene foam, PET bottle, other recyclables plastics, transparent glass bottle and colored glass bottle.

The category of residual includes non-recyclable paper, paper diaper/napkins, non recyclable plastics, other glasses, textile and other fibers, leathers and rubber including tire, ceramics/stone, cement, soil, batteries and lamps bulbs

Source: JICA Study Team

The physical composition on the Mainland of Malay is shown in Figure 5.2.2. The waste from hotels and restaurants includes the large quantity of biodegradable waste as well as on Boracay Island but the waste from institutions does not generate a large quantity of biodegradable waste. Biodegradable waste occupies a large portion of the total as 42% and recyclable and residual wastes occupies almost the same portions as 30 % of recyclable and 28% of residual wastes respectively.

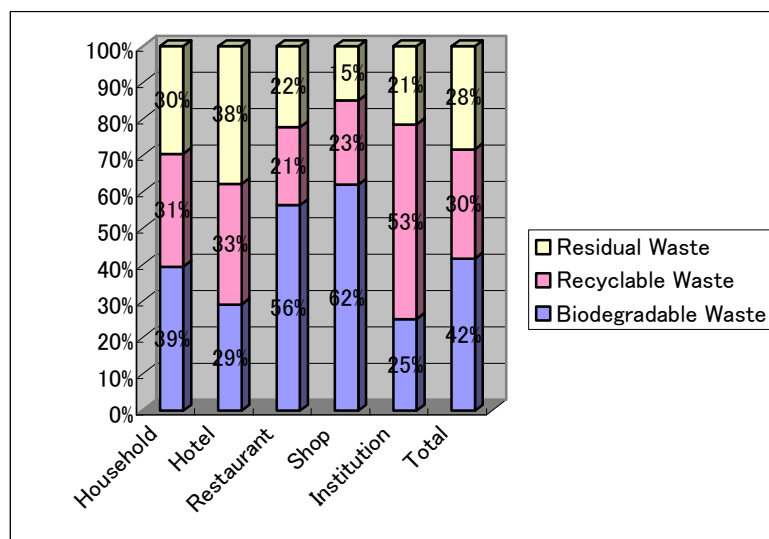


Figure B.5.2-2 Physical Composition of Waste Quality on the Mainland of Malay

Note: The category of biodegradable includes food waste, wood/grass and animal waste

The category of recyclable includes recyclable paper, polystyrene foam, PET bottle, other recyclables plastics, transparent glass bottle and colored glass bottle.

The category of residual includes non-recyclable paper, paper diaper/napkins, non recyclable plastics, other glasses, textile and other fibers, leathers and rubber including tire, ceramics/stone, cement, soil, batteries and lamps bulbs

Source: JICA Study Team

The physical composition of the waste obtained from different generation sources during dry season is shown in the following Table 5.2-1. Food waste occupies a large portion of total waste except the waste from institution. On the other hand, wood, paper or non recyclable plastic occupies a large portion institution. Regarding other features, paper diaper /napkins occupies a large portion of the waste from household (7%). According to this figure, the waste which has opportunity for source reduction or recycling occupies a large portion (approximately 30 to 40%) as well as biodegradable waste which can be used for composting.

Table B.5.2-1 Physical Composition of Waste Quality During Dry Season

Items		Household	Hotel	Restaurant	Shop/Market	Institution	Total Ratio
1	Food Waste excluding bone and shell, egg shell	14%	20%	47%	20%	8%	21%
2	Food Waste (bone and shell, egg shell)	5%	4%	7%	12%	4%	7%
3	Wood/Grass	10%	4%	8%	3%	16%	7%
4	Animal waste	0%	0%	0%	0%	0%	0%
5	Recyclable paper (paper carton, news paper, magazine, etc.)	8%	18%	6%	19%	17%	12%
6	Non recyclable paper (tissue paper, cotton, wipes, tetra-pack, cigarette, etc.)	4%	9%	8%	9%	14%	7%
7	Paper diaper/ napkins	7%	3%	1%	1%	0%	4%
8	Styrene Foam	1%	1%	0%	1%	5%	1%
9	PET bottle	2%	3%	2%	3%	4%	2%
10	Other recyclable plastic (other bottle, straw, CD)	6%	8%	2%	8%	5%	6%
11	Non recyclable plastics (film bag, wrap or film for food or snack, doypack, sachet)	12%	12%	10%	10%	11%	11%
12	Transparent glass bottle	8%	6%	4%	3%	7%	6%
13	Colored glass bottle	3%	1%	2%	2%	0%	2%
14	Other glasses (flat glasses and drinking glasses)	6%	0%	0%	2%	0%	3%
15	Steel can, etc.	4%	6%	2%	1%	4%	4%
16	Aluminum can, etc.	1%	1%	1%	1%	2%	1%
17	Other metal	1%	0%	0%	0%	0%	0%
18	Textile and other Fibers	3%	4%	0%	1%	1%	2%
19	Leathers and Rubber including Tire	2%	0%	0%	3%	0%	2%
20	Bulky wastes (old appliance equipment, etc.)	0%	0%	0%	0%	0%	0%
21	Ceramics/Stone, Cement, Soil	2%	0%	0%	0%	1%	1%
22	Batteries and lamp bulb	1%	0%	0%	0%	1%	0%
23	Others	0%	0%	0%	1%	0%	1%
Total		100%	100%	100%	100%	100%	100%

Source: JICA Study Team

The physical composition of the waste obtained from different generation sources during rainy season is shown in Table B.5.2-2. Food waste occupies a large portion of total waste except the waste from institution as well as dry season. On the other hand, wood, paper or non recyclable plastic occupies a large portion in institution. Regarding other features, transparent glass bottle occupies a large portion of the waste from household (17%) as well as paper diaper /napkins (7%). According to this figure, the waste which has opportunity for

source reduction or recycling occupies a large portion (approximately 30 to 40%) as well as biodegradable waste which can be used for composting.

Table B.5.2-2 Physical Composition of Waste Quality During Rainy Season

Item		Household	Hotel	Restaurant	Shop/Market	Institution	Total Ratio
1	Food Waste excluding bone and shell, egg shell	13%	23%	42%	51%	9%	28%
2	Food Waste (bone and shell, egg shell)	2%	4%	4%	1%	1%	3%
3	Wood/Grass	15%	10%	4%	1%	13%	9%
4	Animal waste	1%	1%	0%	0%	1%	0%
5	Recyclable paper (paper carton, news paper, magazine, etc.)	8%	11%	8%	17%	19%	11%
6	Non recyclable paper (tissue paper, cotton, wipes, tetra-pack, cigarette, etc.)	4%	11%	6%	6%	11%	6%
7	Paper diaper/napkins	7%	2%	1%	0%	3%	3%
8	Styrene Foam	1%	1%	0%	0%	5%	1%
9	PET bottle	3%	5%	4%	2%	4%	3%
10	Other recyclable plastic (other bottle, straw, CD)	4%	3%	3%	3%	7%	3%
11	Non recyclable plastics (film bag, wrap or film for food or snack, doypack, sachet)	15%	14%	13%	9%	14%	13%
12	Transparent glass bottle	17%	6%	5%	3%	6%	10%
13	Colored glass bottle	4%	2%	1%	2%	3%	3%
14	Other glasses (flat glasses and drinking glasses)	0%	1%	0%	0%	0%	0%
15	Steel can, etc.	4%	3%	4%	2%	1%	3%
16	Aluminum can, etc.	0%	0%	0%	1%	1%	0%
17	Other metal	0%	0%	0%	0%	0%	0%
18	Textile and other Fibers	0%	0%	0%	1%	0%	0%
19	Leathers and Rubber including Tire	1%	0%	1%	0%	1%	0%
20	Bulky wastes (old appliance equipment, etc.)	0%	0%	0%	0%	0%	0%
21	Ceramics/Stone, Cement, Soil	1%	1%	2%	0%	1%	1%
22	Batteries and lamp bulb	0%	0%	0%	0%	0%	0%
23	Others	0%	2%	2%	1%	0%	3%
Total		100%	100%	100%	100%	100%	100%

Source: JICA Study Team

5.2.2 Bulk Density

The bulk density of the generated wastes in the study area is shown on Table B.5.2-3. It shows that bulk density during dry season on Boracay Island is higher compared to rainy season while on the Mainland of Malay the bulk density during dry season does not increase so much during the rainy season.

Table B.5.2-3 Bulk Density of Generated Waste

Area	Dry Season	Rainy Season
Yapak	0.194	0.163
Balabag	0.280	0.279
Manoc-Manoc	0.272	0.263
Caticlan	0.101	0.103

Source: JICA Study Team

5.2.3 Moisture Content

Samples were taken from biodegradable waste for each source for moisture content analyses and being conducted for 5 consecutive days. Table B.5.2-4 shows the result of the moisture content during the dry season survey and Table B.5.2-5 shows the result during the rainy season survey.

During dry season, samples taken from the household in Balabag on Boracay Island have the highest moisture content value as about 81%, while in Caticlan on the Mainland of Malay the highest moisture content value was about 71%. During rainy season, most of the biodegradable wastes had high value of moisture content ranging from 68% to 92% because the samples were wet when they were taken.

Table B.5.2-4 Results of Moisture Content Analyses on Dry Season

Area/Source	Moisture Content, %					
	Day 1	Day 2	Day 3	Day 4	Day 5	Average
Yapak						
Household	94.15	52.44	84.07	79.88	78.99	77.91
Hotel	72.04	50.08	53.06	-	45.39	55.14
Restaurant	61.72	84.75	63.21	73.95	62.82	69.29
Balabag						
Household	59.74	83.65	<i>10.14</i>	88.7	92.28	80.84
Hotel	72.52	<i>38.64</i>	<i>66.67</i>	58.06	83.1	70.09
Restaurant	50.95	78.68	<i>77.3</i>	96.68	91.54	79.03
Shops/Market	53.34	<i>20.56</i>	<i>16.68</i>	79.74	<i>15.94</i>	66.54
Institution	70.28	58.98	<i>46.31</i>	92.47	86.81	77.14
Hospital/Clinic	<i>12.56</i>	<i>6.35</i>	<i>35.06</i>	66.58	68.06	67.32
Manok-Manoc						
Household	54.76	76.13	59.84	79.51	51.45	64.34
Hotel	69.44	60.92	65.86	71.77	29.14	59.43
Restaurant	54.94	<i>37.22</i>	68.89	62.34	79.31	60.54
Shops/Market	35.97	<i>77.76</i>	88.88	94.9	91.92	77.89
Institution	50.3	61.21	<i>11.85</i>	<i>28.57</i>	<i>41.25</i>	55.76
Hospital/Clinic	54.76	<i>21.82</i>	<i>15.97</i>	-	<i>32.74</i>	54.76
Caticlan						
Household	<i>39.74</i>	74.02	67.82	75.44	59.25	69.13
Hotel	<i>47.06</i>	52.58	<i>46.88</i>	52.66	70.66	58.63
Restaurant	67.7	49.26	68.96	66.98	74.4	65.46
Shops/Market	<i>26.08</i>	63.85	80.66	<i>13.08</i>	61.14	68.55
Institution	52.25	52.7	50.87	<i>29.84</i>	73.17	57.25
Hospital/Clinic	86.62	32.86	83.34	58.73	53.8	70.62

Note: Italic value means abnormal data and not included in the computation of average result - means no sample was taken.

Source: JICA Study Team

Table B.5.2-5 Results of Moisture Content Analyses on Rainy Season

Area/Source	Moisture Content, %					
	Day 1	Day 2	Day 3	Day 4	Day 5	Average
Yapak						
Household	52.30	91.92	93.06	63.04	85.26	77.12
Hotel	<i>49.97</i>	91.42	86.04	84.30	68.68	76.08
Restaurant	91.18	84.72	80.84	77.89	<i>40.20</i>	83.66
Balabag						
Household	88.06	86.22	87.50	92.80	71.62	85.24
Hotel	88.64	89.26	90.18	77.24	81.66	85.40
Restaurant	80.72	88.76	89.58	<i>36.72</i>	64.69	80.94
Shops/Market	86.55	<i>21.16</i>	81.82	77.78	85.58	82.93
Institution	83.53	89.78	71.32	73.29	56.12	74.81
Hospital/Clinic	78.34	78.47	<i>43.14</i>	54.70	91.14	75.66
Manok-Manoc						
Household	80.51	74.90	<i>48.38</i>	90.68	74.98	80.27
Hotel	85.22	89.09	81.43	85.76	87.70	85.84
Restaurant	56.90	92.12	88.39	88.88	88.98	83.05
Shops/Market	89.99	93.90	94.11	95.60	86.30	91.98
Institution	91.76	85.26	89.04	53.60	87.12	81.36
Hospital/Clinic	-	-	-	76.14	<i>36.14</i>	76.14
Caticlan						
Household	61.08	73.74	82.34	84.64	72.60	74.88
Hotel	72.44	33.54	75.72	58.78	64.22	67.79
Restaurant	53.58	77.08	86.94	86.03	89.20	78.57
Shops/Market	<i>42.96</i>	85.00	53.42	55.56	89.31	70.82
Institution	70.72	80.30	58.54	77.09	<i>47.90</i>	71.66
Hospital/Clinic	84.20	<i>41.85</i>	91.41	88.65	91.75	89.00

Note: *Italic value means abnormal data and not included in the computation of average result - means no sample was taken.*

Source: JICA Study Team

5.3 Waste Quantity Survey

The quantity of collected waste as normal collection activities for each barangay in dry season is shown in Table 5.3.1. Biodegradable waste is the largest among three types of waste and followed by recyclable waste. In addition, the quantity of waste in total waste quantity in Barangay Balabag occupies more than 50% of the waste quantity on Boracay Island.

Table B.5.3-1 Quantity of Waste Collected in each Barangay in Dry Season

Area	Quantity (kg/day)			
	Biodegradable	Recyclable	Residual	Total
Balabag	3622	2409	1768	7799
Manoc-Manoc	-	-	-	3379
Yapak	-	-	-	683
Caticlan	-	-	-	802

Note: Because only Baranagy Balabag adopts segregated collection of biodegradable, recyclable and residuals wastes, there is no data for each type of waste such as biodegradable, recyclable and residual wastes in the table.

Source: JICA Study Team

The quantity of collected waste as normal collection activities for each barangay in rainy season is shown in Table 5.3.2. Biodegradable waste is the largest among three types of waste and followed by recyclable waste as well as dry season and the portion of biodegradable waste in rainy season is more than dry season. In addition, the quantity of waste in total waste quantity in Barangay Balabag occupies more than 50% of the waste quantity on Boracay Island as well as dry season.

Table B.5.3-2 Quantity of Waste Collected in each Barangay in Rainy Season

Area	Quantity (kg/day)			
	Biodegradable	Recyclable	Residual	Total
Balabag	3778	2195	1355	7328
Manoc-Manoc	-	-	-	3060
Yapak	-	-	-	552
Caticlan	-	-	-	134

Source: JICA Study Team

The average quantity of waste collected in each barangay in both seasons is shown in Table 5.3.3.

Table B.5.3-3 Average Quantity of Waste Collected in each Barangay in both Seasons

Average of rainy and dry season	Quantity (kg/day)			
	Biodegradable	Recyclable	Residual	Total
Balabag	3,700	2,302	1,562	7,564
Manoc-Manoc	-	-	-	3,220
Yapak	-	-	-	618
Caticlan	-	-	-	468

Source: JICA Study Team

Appendix

Appendix II-B-1 Survey Procedure

1. Procedure of Unit Generation Survey, Waste Quality Survey and Waste Quantity Survey of Generated Waste

(1) Preparation of Survey

	Contents of a activity	Note
1	Select households or business sectors (hotel, restaurant, shop, institution, clinic or hospital)	It is necessary to consider not only a level of income or revenue, but also a place of residence or business sectors.
2	Preparation of data sheet and questionnaire sheet for attribution survey	Data sheet and questionnaire sheet for attribution survey should be prepared by subcontractors with support of the JICA Study Team and the C/P
3	Preparation of equipment and material for each survey	Equipment and material include weighing machine (maximum scale and sensitivity should be considered depending on the target samples for weighing), glove, vinyl sheet, shovel, buckets so on.
4	Explanation to target households or business sectors	-
5	Provide questionnaire sheet for attribution survey to target	It can be implemented during the explanation of the target households and business sectors.
6	Estimate measured amount of each target, especially for business sectors	It is important information to consider the collection method (Number of distributed plastic bags, size of collection truck, etc) from each method

(2) Survey

	Contents of a activity	Note
1	Distributing plastic bags with a tag to target households or business sectors (hotel, restaurant, shop, institution, clinic or hospital)	Preparing a tag showing a serial number, a family name, address and number of family and putting it on each category plastic bag according to the information of questionnaire sheet which is prepared in pre-survey.
2	Collect all the waste generated in previous days from above target households or business sectors	It is to remove the waste stored before the first day of survey period from the waste generated in the first day. Therefore it should be carried out before first day of the Survey.
3	Collect each plastic bags with confirmation of the tag and transport to the MRF in each Barangay	-
4	Unloading and weighing the weight of the plastic bags for each household and business sector	The weight of plastic bag should be deduced from the measured weight for the recording.
5	Tearing plastic bags and pulling out waste on a big vinyl sheet	Two or three pieces of sheet are necessary in order to separately work.
6	Picking up big items from waste and Measuring and recording the weight	Bulky waste, etc. Reducing the amount of recorded data according to times of reducing sample at next procedure and adding the data as input data
7	Mixing waste with shovel on plastic sheet to unify the quality of a sample	Four or six shovels are necessary.

	Contents of a activity	Note
8	Separation the mixed waste into four parts and getting rid of two parts of waste of opposite angle until the remain is 20 to 25kg	It is necessary to reduce amount of sample in order to reduce burden of work. Please take care to mix enough and to select mixed portions as sample to prevent distortion. In addition, it is important to take a picture to identify the sample condition.
9	After the remaining became 20 to 25kg, separate waste into each category (16) on a plastic sheet	It is necessary to prepare container to put separated item with a tag for each container.
10	Measuring and recording weight of each item	Details of item of a category, others should be described. It should be described if there is anything to wise up.
11	Other remain of 20 to 25 kg should be utilized for measuring and recording amount (kg) and volume (liter) by putting waste in a plastic container (about 90L to 100L) to identify the bulk density or/and measurement of water contents.	-
12	Cleaning up	-

2. Procedure of Waste Quantity Survey of Collected Waste and Recycled Waste and Landfilled Waste

(1) Pre-Survey

	Contents of a activity	Note
1	Preparation of equipment and material for each survey	Equipment and material include weighing machine, glove, vinyl sheet, shovel, buckets so on.
2	Confirmation of unloading area, separating area for recycled waste and storage area of landfilled and the weighing area	-
3	Preparation of data sheet	Data sheet should be prepared by subcontractors with support of the JICA Study Team and the C/P

(2) Survey (Collected waste)

	Contents of a activity	Note
1	Select one collection vehicle which transport collected waste into MRF	At least three collection vehicles (biodegradable, recyclable, residue) should be selected for one day.
2	Unloading collected waste (biodegradable, recyclable and residue) to Vinyl sheet	-
3	Weighing the collected waste (biodegradable, recyclable and residue) by weighing machine	Weighing machine should be prepared
4	Count the number of collection vehicle and take the picture of collection vehicle	It is important to take a picture of collection vehicles to identify the amount of waste of the collection vehicle.

(3) Survey (Recycled waste)

	Contents of a activity	Note
1	Weighing the recycled waste after the separation by Barangay workers for each recycled item	At least three collection vehicles (biodegradable, recyclable, residue) should be selected for one day.

(4) Survey (Landfilled waste)

	Contents of a activity	Note
1	Weighing the landfilled waste after separation	At least three collection vehicles (biodegradable, recyclable, residue) should be selected for one day.

Attribution Survey for Solid Waste Survey (for residents)

Name of Family	
Location (including Subdivision, Barangay)	
Telephone / Mobile Number	
Number of Family	
Religious	
Discharger of waste	
Discharge date of waste	
Normal discharge time of waste	
Occupation	
Income / Salary	1. 0 to 5,000 Peso/Month 2. 5,000 to 10,000 Peso/Month 3. 10,000 to 20,000 Peso/Month 4. 20,000 to 40,000 Peso/Month 5. More than 40,000 Peso/Month
Self-disposal	(1) Biodegradable 1. Composting 2. Burying 3. Others () (2) Recyclable 1. Burning 2. Burying 3. Selling to Junk Buyer 4. Others () (3) Residual 1. Burning 2. Burying 3. Others ()
Amount of Self-Disposal	1. Biodegradable (kg/day) 2. Recyclable (kg/day) 3. Residual (kg/day)
Selling Recyclable to Junk Buyer	1. Item Amount (kg/day) 2. Item Amount (kg/day) 3. Item Amount (kg/day) 4. Item Amount (kg/day) 5. Item Amount (kg/day) 6. Item Amount (kg/day) 7. Item Amount (kg/day) 8. Item Amount (kg/day) 9. Item Amount (kg/day)

Attribution Survey for Solid Waste Survey (for business establishment like hotel)

Name of Hotel	
Location (including Subdivision, Barangay)	
Telephone / Mobile Number	
Number of employee	
Discharger of waste	
Discharge date of waste	
Normal discharge time of waste	
Number of bed number	
Number of room	
Daily record of guests	
Area of the business establishment	

Self-disposal	(1) Biodegradable 1. Composting 2. Burying 3. Others () (2) Recyclable 1. Burning 2. Burying 3. Selling to Junk Buyer 4. Others () (3) Residual 1. Burning 2. Burying 3. Others ()
Amount of Self-Disposal	1. Biodegradable (kg/day) 2. Recyclable (kg/day) 3. Residual (kg/day)

Appendix II-B-2 Instruction for Solid Waste Quantity and Quality Survey to Business Sectors

Solid waste sampling for the survey will be continued for 11 consecutive days. This will include 1 day for preliminary survey and 10 days for actual survey. The procedure is as follows;

1. Waste Packing

a. If you are usually segregating for solid waste discharge, segregate all waste for discharge into plastic bags with tag number. You shall be provided with 3 bags; one for recyclable, one for biodegradable and one for residuals. After all waste is put into the plastic bags, you should tie with strings according to color; black for residuals, green for biodegradables and white for recyclable.



b. If you are not practicing segregation, you can mix all in one bag and tie with black strings with tag number.

c. If you are directly selling some of recyclable waste to junk buyers, please put all these materials into one plastic bag and label “for sale” with selling price.

d. If you are disposing of some of solid waste by yourselves, please put all these waste into one plastic bag and label “for self-disposal”.

e. For restaurants, markets or hotels, please put food leftovers in hard plastic containers, if possible.

2. Storage of Packed Waste

All the waste that you have generated for one target day must be kept in your house or yard for pick-up by survey collectors only. Please do not discharge the waste along the road or other waste collection points where solid waste is collected by government truck.



3. Waste Collection

We will collect the plastic bags from 6:00 a.m. to 7:00 a.m.

For any inquiries or clarifications, please contact or text Engr. Danny Castillon (09177423084).

Thank you very much for your cooperation.

Appendix II-B-3 Photos



Sampling of Segregated Discharged Waste
(March, 2007)



Measurement of Collected Waste at MRF (May, 2007)



Each Type of Bamboo Basket
(March, 2007)



Mixing in the Process of Quartering Method of Solid Waste
(March, 2007)



Sorting of Each Type of Waste
(June, 2007)



Measurement of Sorted Waste for Physical Composition Survey (June, 2007)