CONVERTING WASTE PLASTICS TO FUELS
Baseline Study Project

Activity II-2: Assessment of Plastic Waste Management Systems and Practices
A. Cebu City, Philippines

United Nations Environment Programme
Division of Technology, Industry and Economics
INTERNATIONAL ENVIRONMENTAL TECHNOLOGY CENTER

CONTENTS

TABLES

FIGURES

LOCAL TERMS

Bakat	Huge woven baskets
Barangay	Smallest political unit in the Philippines
Basura	Trash
Bayanihan	Community cooperation
Gawad Kalinga	Extend Care
Kagawad	Councilor
Kalikasan	Environment
Katilingbanong Pagdumala Sa Biya	Community taking care of Nature
Kwarta sa Basura	Trash for Cash
Sagguniang Barangay	Barangay Council
Sangguniang Pambayan	City Council
Sangguniang Panlalawigan	Provincial Council
Sanguniang Kabataan	Youth Council
Tri-sikad	Three-wheeled bike
Kaabag sa Sugbu	Cebu Helping Hand
Gawad Kalinga	Confering Care
Sagip Pasig	Save the Pasig River

ACRONYMS

3R	Reduce, Reuse and Recycling
ADB	Asian Development Bank
ARMM	Autonomous Region of Muslim Mindanao
ASPRO	Asian Partnership Programme Towards Shared Prosperity
ATC	Authority-to-close
BMZ	German Federal Ministry for Economic Cooperation and Development
BRT	Bus Rapid Transit
BSRP	*Bayanihan* Savings Replication Program
BSWMC	*Barangay* Solid Waste Management Committee
CAR	Cordillera Administrative Region
CBPNBAAI	Cebu Business Park and Neighbouring Barangays Altruistic Alliance
CCTF	Cebu Common Treatment Facility
CDCC	Cebu City Disaster Coordinating Council
CDFS	Controlled Disposal Facility
CDIA	Cities Development Initiative for Asia
CDM	Clean Development Mechanism
CEBU–PCEEM	Cebu–Partners Committed to Environmental and Economic Management
CESET	Cebu Environmental Sanitation Enforcement Team
CHI	Cebu Holdings Inc.
CIDA	Canadian International Development Agency
CMSWMB	City Solid Waste Management Board
CPDO	City Planning and Development Office
CSR	Corporate Social Responsibility
CSWMB	City Solid Waste Management Board
D'GWEN	Disposal of Garbage and Waste Enforcement for Nature
DA	Department of Agriculture
DAO	Department Administrative Orders
DBP	Development Bank of the Philippines
DED	German Development Service
DEG	German Finance Company for Investments in Developing Countries
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DOH	Department of Health
DOST	Department of Science and Technology
DPS	Department of Public Services
DPWH	Department of Public Works and Highways
DTI	Department of Trade and Industry
ECC	Environmental Compliance Certificate
ECOGOV	Usaid-Environmental Governance Project
EDF	Economic Development Fund
EIS	Environmental Impact Statement
EMB	Environmental Management Bureau
EMF	Environmental Guarantee Fund
ERPAT	Empowerment, Reaffirmation of Paternal Ability Training
ESWMA	Ecological Solid Waste Management Act
ETVP	Environmental Technology Verification Protocol
GKKLPMPC	*Gagmay'ng Kristohanong Katilingban Lihok-Pagtinabangay* Multi-Purpose Cooperative
GSIS	Government Service Insurance System
GTZ	*Deutsche Gesellschaft für Technische Zusammenarbeit*
ICT	Information, Communication and Technology
IEC	Information, Education and Communication

IEC	Information, Education and Communication
INWENT	Capacity Building International, Germany
IRR	Implementing Rules and Regulations
ISWM	Integrated Solid Waste Management
IUCN	World Conservation Union
IWEX	Industry Waste Exchange Network
JBIC	Japan Bank for International Cooperation
JC	Joint Circular
JICA	New Japan International Cooperation Agency
JICA	Japan International Cooperation Agency
JPEPA	Japan-Philippines Economic Partnership Agreement
KFW	German Development Bank
KSBP	*Kwarta sa Basura* Program
LBP	Landbank of the Philippines
LCP	League of Cities of the Philippines
LGPMS	Local Government Performance Measurement System
LGSWMP	Local Government Solid Waste Management Plan
LGU	Local Government Units
LMP	League of Municipalities of the Philippines
LPP	League of Provinces of the Philippines
MC	Memorandum Circular
MCEC	Metro Cebu Environmental Council
MMDA	Metro Manila Development Authority
MMT	The Multipartite Monitoring Team
MOB	My Own Bag
MRF	Materials Recovery Facilities
MSW	Municipal Solid Waste
NCR	National Capital Region
NEC	National Ecology Center
NGAS	National Government Agencies
NIS	New Independent States
NSWMC	National Solid Waste Management Commission
ODs	Open dumpsites
P2F	Waste Plastic to Fuel
PASSI	Pollution Abatement Systems Specialists, Inc.
PBSP	Philippine Business for Social Progress
PD	Presidential Decrees
PENRO	Provincial Environmental and Natural Resources Office
PEPP	Philippine Environment Partnership Program
PIA	Philippine Information Agency
PIIP	Priority Infrastructure Investment Plan
PPP	Public-private Partnerships
PSP	Private Sector Participation
PSWMB	Provincial Solid Waste Management Board
RE ACT	Renewable Energy Act
SRP	South Road Properties
SWM	Solid Waste Management
SWMF	National Solid Waste Management Fund
TESDA	Technical Education and Skills Development Authority
TFK	Task Force *Kalikasan*
TSD	Treatment, Storage and Disposal
UNFCC	United Nations Framework Convention on Climate Change

ASSESSMENT OF WASTE PLASTICS MANAGEMENT SYSTEMS AND PRACTICES

1. BACKGROUND AND OBJECTIVES

The Assessment for Waste Plastic Management Systems and Practices is a report written to complement the Plastic Waste Analysis and Characterization Study conducted in Cebu City. The goal of the data collection for waste plastics and the city solid waste management (SWM) system is to develop a viable plan for converting waste plastics into a resource. Setting up a demonstration project for waste plastics to fuels (P2F) conversion would require a thorough understanding of the general SWM and the particular practices involved in managing waste plastics.

In this light, this paper aims to assess current waste management systems and find gaps with reference to waste plastics management for formulating recommendations to make improvements in managing solid wastes, particularly waste plastics.

Primary and secondary data gathering are conducted to capture the evolving process with respect to laws, institutions, financial mechanisms, technologies and stakeholder participation.

In addition to quantification and characterization of waste plastics, the assessment of current solid waste management systems covering waste plastics would help to:

- Analyze the availability, enforcement and impact of regulations and economic tools;
- Assess the institutional framework, resources and jurisdictions for current institutions;
- Analyze the efficiency and effectiveness of collection, treatment and disposal system including technologies;
- Understand the role of different stakeholders at different levels of waste plastics management chain; and
- Identify the challenges and opportunities to improve waste plastics management based on 3R (reduce, reuse and recycling) approach

2. DATA GATHERING ROADMAP

In the Philippines, plastic wastes is a fairly newly-recognized waste stream since waste classification and characterization has only started to be mainstreamed after the Republic Act 9003-Ecological Solid Waste Management Act (RA 9003-ESWMA) was enacted in year 2000. Specific plastic waste management systems, policies and technologies are therefore still in emergent state.

To be able to understand how plastic wastes are being managed in the country in general, and in the LGUs in particular, one needs to look into general SWM chain, the systems and practices

in which this management chain operates, as well as the laws, regulations, technologies and institutions involved in general SWM.

A solid waste management system involves the flow or chain of activities in handling or managing a particular waste stream from the waste generator down to final disposal and along other intermediate activities. The system could include proactive or upstream measures such as source reduction and downstream or end of the pipe management stages such as primary disposal or disposal by the waste generator, collection and transportation, treatment, reuse, recycling, recovery, and final disposal.

The World Bank defines the types of wastes according to source as:

Municipal solid waste (MSW): Includes non-hazardous waste generated in households, commercial and business establishments, institutions, and non-hazardous industrial process wastes, agricultural wastes, and sewage sludge. As part of municipal solid waste, commercial waste includes all municipal solid wastes emanating from business establishments such as stores, markets, office buildings, restaurants, shopping centers, and entertainment centers.

Industrial waste: A heterogeneous mixture of different materials generated during an industrial operation.

Hazardous waste: Waste generated that can pose a substantial or potential hazard to human health or the environment when improperly managed.[1]

In the Philippines, the responsibility of regulating and monitoring solid wastes rests in local government units (LGU) pursuant to the RA 9003. The law mandates barangays to implement programs for managing compostable and recyclable wastes. The city and the municipal governments, on the other hand, manage the residual and the special household hazardous wastes. Provincial governments assist the LGUs with complementary programs.

Such is the case of Cebu City. This responsibility covers solid waste from residential, commercial and industrial sources, except hazardous wastes from industrial and commercial sources. Hazardous wastes are regulated and monitored by the Department of Environment and Natural Resources (DENR), through the Environmental Management Bureau (EMB) as mandated by the RA 6969- Hazardous Waste Act.

Solid waste management systems may be classified with respect to the responsible institution[2]. In Cebu City, two waste management systems are identified. First is the municipal SWM system covering residential, commercial and some industrial solid waste, with the exclusion of hazardous wastes. The city government is the institution responsible for this system through different city government offices such as the Department of Public Services, the City Solid Waste Management Board and other related units. Most industries manage their solid wastes independently from the city. They operate under a self-monitoring scheme and engage private

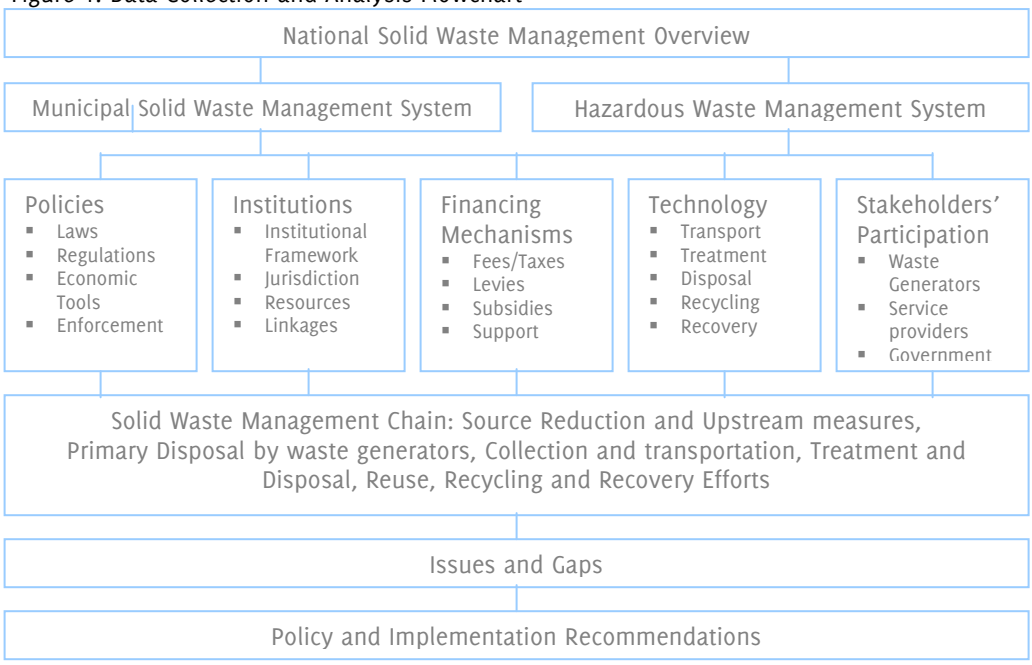
[1] World Bank, Philippine Environment Monitor 2001 Solid Waste, 2001.
[2] UNEP-DTIE,IETC, Guidelines for Assessment of Waste Plastics, 2009.

service providers for the collection, segregation and/or hauling their waste to the disposal site. Their hazardous wastes on the other hand, are under the authority of DENR-EMB. This makes up the second solid waste management system covering hazardous and hospital care waste with DENR-EMB as the lead institution.

Both the different waste streams and the institutions responsible for these wastes determine the context from which the roadmap for data gathering to assess the SWM systems and practices of a given LGU is mapped. First, the national solid waste situation is presented including solid waste profile and projection, and the general SWM policies at the international and national levels. Relevant national standards and regulations are also presented to complete a policy-level overview of solid waste management in the country. Second, the different SWM systems at the local level are identified. Third, focusing on local systems and practices, data is gathered on the SWM policies, concerned institutions, financing mechanisms, existing SWM technologies and the participation of stakeholders. Fourth, the interface of these factors that make up the system are collated and organized based on the local SWM chain starting from source reduction, primary disposal, collection, transportation, treatment, reuse, recycling and recovery efforts, down to final disposal. Finally, issues and gaps are identified and provided appropriate recommendations. The data gathering flow is illustrated in Figure 1.

Data gathering methodologies included secondary research by collection and review of printed and online literature, primary source research utilizing focus group discussions, interviews, and site visits.

Figure 1. Data Collection and Analysis Flowchart



Source: Guidelines for Assessment of Waste Plastics Characterization, Systems and Practices, UNEP-DTIE-IETC, March 2009

All policy provisions mentioned in the narrative indicating source section number is from Republic Act 9003, unless indicated. Summary matrices attempt to capture actual practices in the city, rather than focus the general picture of SWM based on policies.

3. EXECUTIVE SUMMARY

Table 1 provides and overview of the municipal and hazardous wastes management systems in Cebu City. It summarizes the capacities and challenges in both systems.

A highly urbanized city, Cebu is faced with an increasing rate of waste generation. It generates from 15 to 20% plastics, amounting to more or less 60 tons plastic of about 400 tons of waste a day.[3] Recovery of waste plastics is relegated to the informal sector depriving the city of an abundant resource that could be converted into fuels.

Policy on solid waste management is quite comprehensive, although there are no specific regulations on the utilization of plastic and its consequent waste products. Aside from this gap, other areas that should be addressed by appropriate policy are recovery, recycling and utilization of waste materials, including plastics. The Renewable Energy Act encourages waste to energy conversion and provides incentives for such infrastructure.

Cebu City is blessed with a vibrant NGO community doing complementary work on community-based waste management (CBWM). It also has a proactive commercial and industry sector engaging in various initiatives for the environment, particularly solid waste. However, majority of household waste generators dispense their responsibility to the LGU. Their support, especially in the areas of source reduction, source segregation and primary recovery will be crucial in implementing any SWM system, program or project.

Currently, plastic waste management is being undertaken by the informal sector that has an undocumented number of waste pickers, small buyers and junkshops. Waste plastic is transported to major recycling factories in Mindanao and Manila divesting the city of this resource.

There is a need to mainstream waste recovery, reuse and recycling in the city's solid waste management program, especially of waste plastics and other non-residuals. This will entail a shift of priorities from collection and disposal to recovery and utilization. It necessitates major local SWM reform, from policy (and can be included in the proposed City Environmental Code), funding, and practice.

The city government needs to be able to gather all stakeholders, define their specific roles, and encourage them to do their share in the ecological management of waste. It also needs to access required resources from international and local donors who provide funding window for a comprehensive and integrated SWM system utilizing environmentally sustainable technologies and practices, including P2F conversion.

[3] From various estimates

Table 1. Solid Waste Management Systems, Cebu City (1/3)

MUNICIPAL SOLID WASTE		HAZARDOUS WASTE	
CAPACITY	CHALLENGES	CAPACITY	CHALLENGES
Regulations and Laws			
Basel Convention -aims to reduce transboundary movement of hazardous wastes	JPEPA -	RA 6969 -provides regulations, incentives and fines	JPEPA, Cebu City being a major port city might be the destination for "post-consumer", but contaminated plastics
UNFCC-Kyoto-CDM	Accessing funding windows for P2F project		Management and regulations of Hospital care waste
RA 9003:			
-Defines LGU roles in SWM	-burden given to barangays lacking resources or technical know-how	JAO 05-02	
-Focus on 3Rs	-end of pipe approach being prioritized by LGUs		
-Time-bound targets	-not enough resources and support to achieve targets		
-Stringent provisions (incineration ban)	-		
-Provides for eco-labeling	-Weak eco-labeling program		
-Phase out of non-eco packaging	- slow pace of implementation		
-Citizen suit provision	-Used as political ploy -Administrative cases piling up, but no official actually penalized		
-personal protective equipment required for waste collectors and handlers	-No protection, waste picking at all levels a common practice of the informal sector		
-Recycling market development	- Still focused at the cottage industry level		
-Requires Brgys. Or clusters to set up MRF	Siting problem for MRFs especially in highly urbanized barangays		
City Ordinance 1361 -No segregation, no collection	-Weak enforcement		
RA 7160 -Defines LGU role -Cooperation among LGUs in solving common SWM problems -Authority to collect fees	NIMBY mentality	DAO 24-98	

Table 1. Continuation (2/3)

MUNICIPAL SOLID WASTE		HAZARDOUS WASTE	
CAPACITY	CHALLENGES	CAPACITY	CHALLENGES
Clean Water Act -Comprehensive waste resource management	-landfill leachate left untreated and might contaminate groundwater and aquifer		
Clean Air Act -Stringent provisions (incineration ban)	-technology assessment to identify non-eco tech aside from incineration		
Renewable Energy Act -provides for waste to energy technologies such as P2F			
Institutions			
DENR-NSWMC - Requires SWM Plans at Provincial, City/Municipal and Barangay Levels	inadequate means and resources to evaluate and approve all LGU plans, monitor and implement specific programs	DENR-EMB	
City: City SWM Board, CPDO, DPS, CESET	Inadequate implementation of laws compliance to standards enforcement of provisions	Industries	Insufficient compliance
Barangay: BSWMC multi-sectoral	Lack of technical know-how and resources to be able to comply	Hospitals	Insufficient compliance
NGOS: Kaabag sa Sugbu. PBSP, GKKLPMPC CBPNBAAI, Lihok Pilipina Installed community-based projects, presence at the	Needed as watchdog for the implementation of the laws		
Service Providers: Mantech and other Haulers Plasironcan and other waste traders Have capital and technology		Service Providers: CATC PASSI	Must offer more accessible services, develop cleaner, cheaper technologies for treatment
International organizations: CIDA, JICA, ADB, Kitakyushu Initiative GTZ, USAID Eco-gov Provide various means to assist environmental and SWM projects	Fund matching		

Table 1. Continuation (3/3)

MUNICIPAL SOLID WASTE		HAZARDOUS WASTE	
CAPACITY	CHALLENGES	CAPACITY	CHALLENGES
Financial Mechanisms			
Provides for tax incentives	Tax incentives to end in January 2010 just when RA 9003 is starting to be mainstreamed	Incentives, tax exemptions	Varied but sometimes inaccessible
Appropriations to relevant agencies and individual LGUs	Inadequate allotment	Fines	Stricter enforcement
Incentives, Support, Subsidies Privatization, Fees, Fines Private Initiated Projects Franchise, Contracts and Open Market ventures	Varied but sometimes inaccessible especially to small-scale projects for CBWM		
Technology			
Primary Disposal Collection, Transfer and Transportation	Focus on collection and disposal Appropriate technology needed for treatment and disposal Reuse, recycling and recovery	Transport Autoclaving Betseda Biosolutions Chemical Disinfection	Expensive services deterring companies to avail of treatment
Stakeholder Participation			
Waste Generators: Households Private and Public Institutions Service providers Government	Clarify roles, better interface needed	DENR-EMB Hospitals/Clinics Industries Service Providers	Clarify roles DOH and EMB in regulating hospital waste

4. NATIONAL SOLID WASTE MANAGEMENT SITUATION

4.1. National Solid Waste Profile and Projection

Based on RA 9003, LGUs are the lead implementing agency for SWM programs. The LGUs operate under the National Solid Waste Management Framework that clearly defines the Philippine 3R strategy as: Avoid, Reduce, Reuse, Recycle, Treat, and Dispose. Local policies, programs and projects in managing solid waste revolve around this strategy.

In 2001, World Bank projected waste generation increase in the Philippines from 10.67 million tons/year in 2000 to 14.05 million tons/year in 2010.[4] The figures registered more than 30% increase in only ten years.

Table 2. National Waste Generation, 2000-2010

REGION	2000		2010	
	MIL. T/YR.	% OF TOTAL	MIL. T/YR.	% OF TOTAL
National Capital Region (NCR)	2.45	23.0	3.14	22.3
Cordillera Administrative Region (CAR)	0.17	1.6	0.21	1.5
Ilocos	0.50	4.7	0.63	4.5
Cagayan Valley	0.32	3.0	0.40	2.8
Central Luzon	0.96	9.0	1.32	9.4
Southern Tagalog	1.42	13.3	2.11	15
Bicol	0.54	5.1	0.65	4.6
Western Visayas	0.82	7.7	1.00	7.1
Central Visayas	0.74	7.0	1.01	7.2
Eastern Visayas	0.43	4.0	0.51	3.6
Western Mindanao	0.40	3.8	0.53	3.8
Northern Mindanao	0.37	3.4	0.47	3.4
Southern Mindanao	0.70	6.6	0.97	6.9
Central Mindanao	0.33	3.1	0.41	2.9
Autonomous Region of Muslim Mindanao (ARMM)	0.26	2.5	0.39	2.7
Caraga	0.26	2.4	0.31	2.2
National	10.67	100	14.05	100

Assumptions: Waste production rates2:
National Capital Region: 0.71 kg/person/day urban population: 0.5 kg/person/day rural population: 0.3 kg/person/day
It was assumed that the urban population would increase their waste production rate by 1 percent per year due to rising income levels (based on GHK/MRM International Report). Urban and rural population and growth rates by region are based on National Statistical Office, data for 2000.

Source: Philippine Environment Monitor, World Bank 2001

The National Solid Waste Management Commission (NSWMC) reports that the country's solid waste generation per day is at 30,000 tons. It is composed of 73% from households, 26% from commercial establishments, industries, institutions and 1% from healthcare facilities.[5]

[4] World Bank, Philippine Environment Monitor 2001 Solid Waste, 2001.
[5] Aguinaldo, E. 2008, "National and Local Initiatives on Solid Waste Management and Implementation of 3Rs in the Philippines", *Environment and Livable Cities 08*, Manila, Philippines.

Although RA 9003 requires the mainstreaming of waste recycling and recovery, these are mainly taken up by the informal sector. For instance, only 6% of solid waste was recycled in Metro Manila in 1997 which increased to only 25% in 2007. As of the second quarter of 2008, only 2,361 Materials Recovery Facilities (MRF) are established serving 2,634 barangays nationwide, based on the NSWMC database. This is only .05% of the 42,000 barangays nationwide that should have established their own facility.

As provided by the law, all open dumpsites and controlled disposal facilities should have been closed by February 16, 2004 and February 16, 2006, respectively. Currently, more than 1,000 open dumpsites and controlled disposal facilities are still operating. Conversion of these disposal sites to sanitary landfills encounter siting and financing difficulties. [6]

4.2. International Agreements on Solid Waste

The Philippines is signatory to the **Basel Convention** which aims to to reduce transboundary movements of wastes subject to the Convention to a minimum consistent with the environmentally sound and efficient management of such wastes; to minimize the amount and toxicity of wastes generated and ensure their environmentally sound management as closely as possible to the source of generation; and to assist LDCs in environmentally sound management of the hazardous and other wastes they generate.[7]

The Philippines is also party to the **United Nations Framework Convention on Climate Change (UNFCC)**. Its main objective is to achieve stabilization of greenhouse gas (GHG) concentrations in the atmosphere at a low enough level to prevent dangerous interference with the climate system.[8] In relation to setting up of demonstration project of a P2F conversion facility , this Agreement is relevant as windows for funding can be accessed through the Clean Development Mechanism pursuant to the UNFCC and the Kyoto Protocol.

On the other hand, an important bilateral agreement with the Japanese government pose serious implications to the country in terms of importation of post consumer plastics. On September 9, 2006, the Philippines signed the **Japan-Philippines Economic Partnership Agreement** (JPEPA) in Helsinki, Finland. JPEPA is a comprehensive bilateral trade and investment agreement between Japan and the Philippines aimed at increasing trade and investment opportunities between the two economies. Under JPEPA, the Philippines would allow duty-free entry for many scrap and waste from Japan, including waste plastics. Some of these waste products are considered to be toxic and hazardous. The environmental implications of this agreement remain to be an important issue in the country.[9]

[6] Ibid.
[7] "Origins of the Basel Convention", 14 June 2009 ‹http://www.basel.int/convention/basics.html›
[8] "UNFCC: Essential Background", 2 June 2009, ‹http://unfccc.int/essential_background/items/2877.php›
[9] JPEPA: An Assessment, Policy Brief, Senate Economic Planning Office, Sept. 2007, 30 June 2009 ‹ http://www.senate.gov.ph/publications/PB%202007-01%20-%20Japan-Philippines%20Economic%20Partnership%20Agreement%20(JPEPA),%20An%20assesment.pdf›

4.3. National Laws on Solid Waste Management

Although there is no national law in the Philippines specifically focused on the management of waste plastics yet, there are major laws that directly or indirectly provide for solid waste management in general and thus cover policy for plastic waste management. This however does not preclude the need for specific enactments to address the growing concern on waste plastics.

The **Philippine Constitution**, enacted in 1987, provides the most fundamental basis for all policies concerning solid waste management in the country. Section 15 declares that the State shall protect and promote the peoples' right to health and instil health consciousness. Section 16 stipulates that 'the State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature.'[10]

A series of presidential decrees (PD) were issued under the administration of President Ferdinand E. Marcos which provided specific guidelines in addressing waste management, sanitation and pollution control. In 1975, **PD 825**, more commonly known as the **Garbage Disposal Law**, was issued. It outlines penalties for improper disposal of garbage. Penalties include imprisonment from five days to one year and/or fines between P100 and P2000.[11]

Issued in the same year, **P.D. 856,** also called the **Sanitation Code of the Philippines**, prescribes guidelines, requirements and restrictions to ensure cleanliness in various establishments. It requires cities and municipalities to provide adequate and efficient collection system, transportation, and disposal in their areas of jurisdiction in a manner approved by the local health authority.[12]

PD 984 also known as **Pollution Control Decree of 1976** mandates the adoption of a system for a safe and sanitary disposal of wastes. It also provides guidelines for the prevention and control of pollution from solid, toxic, and hazardous wastes. [13]

Two presidential decrees that antedate the current Philippine Constitution laid the foundation for future environmental policies. Both were also issued by President Marcos.

Issued in 1977, **P.D. 1151** or the **Philippine Environmental Policy** states that it is a continuing policy of the State to ensure the attainment of an environment quality that is conducive to a life of dignity and well-being. Section 4 requires the preparation of Environmental Impact Statements for any project or undertaking that may significantly affect the environment.[14]

PD 1151 remains to be the fundamental guide for lawmakers in formulating environmental policies in general, and ecological waste management, in particular.

[10] "The 1987 Philippine Constitution", 4 May 2009, ‹http://www.pcij.org/blog/wp-docs/1987-Philippine-Constitution.pdf›
[11] World Bank, Philippine Environment Monitor 2001 Solid Waste, 2001.
[12] World Bank, Philippine Environment Monitor 2001 Solid Waste, 2001.
[13] "PD 984, [PROVIDING FOR THE REVISION OF REPUBLIC ACT NO. 3931,COMMONLY KNOWN AS THE POLLUTION CONTROL LAW, AND FOR OTHER PURPOSES]", Chan Robles Virtual Law Library, 5 May 2009, ‹http://www.chanrobles.com/pd984.htm›
[14] "PD 1151, PHILIPPINE ENVIRONMENTAL POLICY, 10 May 2009, ‹http://sunsite.nus.edu.sg/apcel/dbase/filipino/primary/phpenv.html›

The following year, **PD 1152** also known as **Philippine Environmental Code** was issued. Under the Philippine Environment Code, specific standards are set for air quality management, water quality management and waste management. This Code provides for the enforcement and guidelines relative to waste management. It gives the Department of Local Government and Community Development (predecessor of the Department of Interior and Local Government (DILG) the task of promulgating guidelines for the formation and establishment of waste management programs. It also mandates LGUs to facilitate the collection, transportation, processing and disposal of waste within its jurisdiction in coordination with other concerned government agencies.[15]

A landmark legislation, **R.A No. 7160 - The Local Government Code (1991)** mandates the responsibility of LGUs in providing basic services to its constituents. It also directs LGUs to exercise powers and discharge functions and responsibilities for efficient and effective provision of services and facilities related to general hygiene and sanitation, beautification, and solid waste collection and disposal systems. [16]

RA 8749 - The Clean Air Act of 1999 provides a comprehensive air pollution management and control program to achieve and maintain healthy air. Section 20 bans incineration of municipal, bio-medical, and hazardous wastes but allows the traditional method of small-scale community burning.[17]

The most comprehensive law on waste management is the **Republic Act 9003 or Ecological Solid Waste Management Act of 2000**. It declares the adoption of a systematic, comprehensive, and ecological solid waste management program as a policy of the State. The ESWMA adopts a community-based approach in waste management. The Law mandates the creation of SWM Boards from the national, provincial, city/municipal, down to barangay level. It requires reduction at source, mandatory segregation at source, recycling and recovery. It also focuses on eco-labelling of non-environment friendly packaging, gradual phase out of open dumpsites, and a citizen suit provision that encourages ordinary citizens to file administrative or criminal cases against violators.[18]

Section 65 states issuances inconsistent with the provisions of RA 9003 are repealed or modified accordingly. Among those repealed and modified are PD 825, PD 1152, and the numerous department administrative orders (DAO) on solid waste management.

In 2004, **RA 9275, Philippine Clean Water Act** was enacted providing for a comprehensive water quality management. The law focuses on prevention, control and abatement of pollution of the Philippine's water resources.[19] Philippine rivers and other water bodies have long been dumping sites for solid wastes to the point that waste pickers go to dead rivers and creeks to fish for recyclables.

[15] "PD 1152 Philippine Environmental Code" Chan Robles Virtual Law Library, 5 May 2009, ‹http://www.chanrobles.com/pd1152.htm
[16] Local Government Code of the Philippines, 4 May 2009, ‹http://www.pcij.org/blog/wp-docs/LGC1991.pdf›
[17] World Bank, Philippine Environment Monitor 2001 Solid Waste, 2001.
[18] "RA 9003", 5 May 2009, ‹http://www.emb.gov.ph/laws/solid%20waste%20management/ra9003.pdf›
[19] "RA 9275", 6 May 2009, ‹http://www.emb.gov.ph/laws/water%20quality%20management/ra9275-clean_water_act.pdf›

Figure 2. Fishing for plastics in the Pasig River c. 1990s

Photo Courtesy of Sagip Pasig Movement

On December 16, 2008, President Arroyo signed **RA 9513 - Renewable Energy Act (RE Act),** with the objective to utilize sustainable energy practices. The Act seeks to make the country 60% energy sufficient by 2010 and to mitigate problems caused by climate change. Salient provisions of the law include on and off-grid renewable energy development, adoption of waste-to-energy technologies and provision of incentives to RE projects.[20] This law provides windows of opportunity for waste to energy projects such as a P2F facility.

4.4. Solid Waste Management Regulations and Standards

The DENR, as the lead implementing agency of international agreements and national laws that deal with solid waste management, issues regulations and standards for their effective implementation, enforcement and monitoring. These regulations and standards come in the form of DAO, memorandum circulars (MC), and joint circulars (JC) co-issued with relevant agencies.

The following regulations and standards apply to plastic waste management:

DENR Administrative Order No.90 Series of 1993 (DAO 93-90) - Creating a Project Management Office on Solid Waste Management under the Presidential Task Force on Waste Management. This Order named the DENR as the lead executing agency for SWM.[21] **DAO 98-49** prescribed

[20] "PGMA signs Renewable Energy Act of 2008 today", 31 June 2009, ‹http://www.gov.ph/index2.php?option=com_content&do_pdf=1&id=15838›
[21] "DAO 93-90", 6 May 2009, ‹http://search.yahoo.com/search?fr=ytff1-msgr&p=Project%20Management%20Office%20on%20Solid%20Waste%20Management%20under%20the%20Presidential%20Task%20Force%20on%20Waste%20Management&ei=UTF-8&type=›

the Technical Guidelines for Municipal Solid Waste Disposal.[22] **DAO 98-50** outlined the identification and screening criteria for municipal solid waste disposal facilities.[23] These Orders were later superseded by RA 9003 and its Implementing Rules and Regulations.

DENR Administrative Order No.29 Series of 1992 (DAO 92-29)- Implementing Rules and Regulations (IRR) of Republic Act 6969. This Order covers the importation, manufacture, processing, handling, storage, transportation, sale, distribution, use and disposal of all unregulated chemical substances and mixtures in the Philippines including the entry, even in transit, as well as the keeping or storage and disposal of hazardous and nuclear wastes into the country.[24]

DENR-DOST Joint Administrative Order No.1 Series of 2006 (JAO 06-01)- Adopting Environmental Technology Verification Protocol (ETVP). This JAO names the DOST as the primary agency and the DENR as support agency in the implementation of ETVP. ETVP findings will be made basis for granting and approving applicable permits or clearances for covered technologies.[25]

DENR Administrative Order No. 2001-34 (DAO 01-34) The IRR of Republic Act 9003 provides details on implementing and enforcing the provisions of the law.[26]

Under Secretary Elisea Gozun of DENR, two more orders relevant to the installation of waste plastics to fuels project were signed. **DAO 2003-14**, signed on June 2, 2003, created the Philippine Environment Partnership Program (PEPP). DAO 2003-14 is a product of multi-sectoral policy dialogue in response to the need and demand of industry for government assistance and incentives to encourage industries to implement and sustain proactive environmental management tools and improve environmental compliance.[27]

On August 4, 2003 **DAO 2003-30** was issued. This order clarified the coverage of the Environmental Impact Statement (EIS). It provides two criteria to be considered in determining the scope of the EIS System: first is the nature of the project and its potential to cause significant negative environmental impacts; and second, the sensitivity or vulnerability of environmental resources in the project area. The specific criteria for determining projects or undertakings to be covered by the EIS System are the main features of the project or undertaking, the location, and the potential impact of the project to the environment[28].

DENR Administrative Order 2006 No.10. (DAO 06-10) Guidelines on the Categorized on Final Disposal Facilities (Sanitary Landfill). This Order addresses MSW disposal, defines the four categories of disposal facilities based on the amount of disposable residual waste increase.

[22] "DAO 98-49", 21 May 2009, ‹http://www.emb.gov.ph/laws/solid%20waste%20management/dao98-49.pdf›
[23] "DAO 98-50" 22 May 2009, http://www.emb.gov.ph/laws/solid%20waste%20management/dao98-50.pdf
[24] "IRR of RA 6969", 5 May 2009, ‹http://sunsite.nus.edu.sg/apcel/dbase/filipino/regs/phrhaz.html›
[25] "JAO 06-01", 20 April 2009,
[26] 27 April 2009, ‹http://www.elaw.org/node/2376›
[27] Philippine Environmental Updates By: Jocelyn J. Gregorio-Reyes Quisumbing Torres Manila, Philippines June 2006 ‹http://www.bakernet.com/NR/rdonlyres/242DB930-BD3F-4421-A9F9-C46E6FABEA3E/0/2006_IEC_Philippines_Country_Paper.pdf›
[28] Ibid.

It also presents the development and operational features of each category, as well as the development, permitting and operational requirements.[29]

5. MUNICIPAL SOLID WASTE MANAGEMENT SYSTEM AND PRACTICES IN CEBU CITY

This part looks into the local implementation of the national policies mentioned in Part 4- National Solid Waste Management System, as well as the local regulations, enforcement, financing mechanisms, SWM stakeholders and existing technologies throughout the entire SWM chain.

Cebu, as one of the leading cities in solid waste management in the country has promulgated several ordinances that address solid waste management in the city:

Cebu City Ordinance No. 2017 "An Ordinance Creating the Cebu City Solid Waste Management Board (SWMB) and Appropriating Funds". Section 2 states the City's policy to ensure the protection of public health and the environment through the adoption and formulation of best environmental practices in ecological waste management. It also recognizes the participation of NGOs and the private sector in developing and implementing of an integrated, comprehensive, and ecological SWM programs.[30]

Cebu City Ordinance No. 1361 "An Ordinance Establishing a System of Garbage Collection, Imposing Fees Therefore, and Expropriating Funds and for Other Related Purposes." The City Council approved this ordinance on April 1, 1990 and still in effect today. This ordinance divides the urban barangays into 21 contiguous zones where each of these garbage zones is assigned a public service manager, a garbage truck, a driver and a crew of garbage collectors and street cleaners.[31]

Cebu City Ordinance No. 2031. "An Ordinance for the Implementation of Solid Waste Segregation at Source, Providing Penalties Thereof and the Creation of a Special Fund for incentives. Enacted by the local council in November 10, 2004, this ordinance localizes the provisions of RA 9003.[32]

5.1. Policies

5.1.1. Source Reduction

Source reduction is one of the salient features of RA 9003. One of its major provisions is mandatory solid waste diversion. It provides for 25% diversion after five years and

[29] Philippines, DENR A.O No. 10, "Guideline on the Categorized on Final Disposal Facilities (Sanitary Landfill)" (Sept 14, 2006) DENR AO. No. 10, "Guideline on the Categorized on Final Disposal Facilities (Sanitary Landfill)" May 27, 2009‹http://emb.gov.ph/nswmc/resources/DAO%2010.PDF›
[30] Cebu City, "Ordinance No. 2017" May 12, 2009
[31] Cebu City, "Ordinance No.1361", 3 May 2009, ‹http://www.globenet.org/preceup/pages/ang/chapitre/capitali/cas/phimana_e.htm›
[32] Cebu City, "Ordinance No. 2031, Nov. 10, 2004.

increases every three years through re-use, recycling, and composting activities and other resource recovery activities. An increase in waste diversion goals is also targeted every three years (Sec. 20). Section 48 prohibits the manufacture, distribution or use of non-environmentally acceptable packaging materials for upstream reduction.

Section 2 states that guidelines and targets for solid waste avoidance and volume reduction should be set. The Local Government Solid Waste Management Plan (LGSWMP) should have a source reduction component with a program and implementation schedules showing methods by which the LGU will reduce a sufficient amount of solid waste disposed (Section 17e).

The LGU source reduction component includes evaluation, identification of rate structure, fees for reducing waste generation, and other source reduction strategies, including programs and economic incentives.

To encourage source reduction initiatives, monetary rewards and other incentives shall be provided to individuals, private organizations and entities, including non-government organizations that have undertaken outstanding and innovative projects, technologies, processes and techniques or activities in re-use, recycling and reduction. The reward will be taken from the Solid Waste Management Fund (Section 45).[33]

Section 30 provides for the revocation, suspension, denial or non-renewal of the license establishments that do not submit their list of non-environmentally acceptable products and packaging after one year of the effectivity of RA 9003.

The manufacture, distribution or use of non-environmentally acceptable packaging materials (Sec.48-10) and importation of consumer products packaged in non-environmentally acceptable materials (Sec.11) are prohibited acts and thus warrant fines and penalties of five hundred thousand pesos (P500,000.00) plus an amount not less than five percent (5%) but not more than ten percent (10%) of the net annual income of violators during the previous year (Section 49-c)

Pursuant to RA 9003, **Cebu City Ordinance No. 2031**, sets guidelines and targets for solid waste volume reduction through source reduction and waste minimization measures (Sec 2c).

5.1.2. Segregation of Waste at Source

One of the main features of RA 9003 is mandatory solid waste segregation at source (Art. 2 Sec. 21). Minimum requirements for segregation and storage including separate container for each type of waste from all sources, except for bulky waste collected and placed in a separate and designated area and properly marked as "compostable", "non-

[33] Philippines, "RA 9003, The Ecological Solid Waste Management Act of 2000", 24 April 2009 ‹http://www.emb.gov.ph/laws/solid%20waste%20management/ra9003.pdf›

recyclable", "recyclable" or "special waste", or any other classification as may be determined.

The law further requires LGUs to promulgate regulations requiring the owner or person in charge of six or more residential units, to provide for the residents a designated area and containers in which to accumulate source separated recyclable materials to be collected by the municipality or private center; and notify the occupants of such buildings of the pursuant to RA 9003 provisions (Sec. 21 a,b).[34]

Cebu City Ordinance No. 1361 states a 'No segregation, No Collection' policy (Sec.40.1.).[35] **City Ordinance 2031** provides the same policy (Sec. 6.1), and further defines segregation in five major groups (Sec.4):
a. biodegradable/compostable wastes (includes yard waste)
b. non-biodegradable wastes
c. reusable/recyclable wastes
d. hazardous or special waste
e. bulky wastes and white goods

Mixing of source-separated recyclable materials with other solid waste in any vehicle, box, container or receptacle used in solid waste collection or disposal, is a prohibited act (RA 9003 Sec. 48.8). Fine for first offence is P500,000.00 plus an amount not less than five percent but not more than ten percent of his net annual income during the previous year. The additional penalty of imprisonment of a minimum period of one year, but not to exceed three years at the discretion of the court, shall be imposed for second or subsequent violations (Sec. 49 c,d).

5.1.3. Primary Storage and Collection

RA 9003 declares violations of sanitation operation causing or permitting the collection of non-segregated or unsorted waste; and unauthorized removal of recyclable material intended for collection by authorized persons as prohibited acts (Sec. 48. 2,4,7).

Fine for first offence is P500,000.00 plus an amount of not less than five percent but not more than ten percent of the violator's net annual income during the previous year. The additional penalty of one to three years of imprisonment shall be imposed for second or subsequent violations (Sec. 49 c,d).

RA 9003 further recommends revisions to building ordinances, to require newly constructed buildings and building alterations to have segregation and storage space and devices enable the LGUs to efficiently collect, process, market and sell the designated materials. Such recommendations shall include, but shall not be limited to

[34] Philippines, "RA 9003, The Ecological Solid Waste Management Act of 2000", 24 April 2009. ‹http://www.emb.gov.ph/laws/solid%20waste%20management/ra9003.pdf›
[35] Cebu City, "Ordinance No.1361", 3 May 2009, ‹http://www.globenet.org/preceup/pages/ang/chapitre/capitali/cas/phimana_e.htm›

separate chutes for source separation in multi-family dwellings, storage areas that conform to fire and safety code regulations, and specialized storage containers (Sec.17, f.3).

Minimum standards and requirements for the collection of solid waste include personal protective equipment to protect collectors from the hazards of handling solid wastes; Necessary training shall be given to them to ensure the proper handling of solid wastes; (Sec 23. a,b,c).

Locally, **Cebu City Ordinance 2031** requires waste generators to store each type of waste in separate receptacles/containers to facilitate collection and disposal. Various types of receptacles/containers may be used depending on the nature of waste (Sec.2)[36]

LGUs, enterprises and private establishments shall enjoy tax and duty exemption on imported capital machinery, equipment, vehicles and spare parts used for collection of solid wastes within ten years upon effectivity of RA 9003, on the condition that the importation of such machinery, equipment, vehicle and spare parts are not manufactured domestically in sufficient quantity, of comparable quality and at reasonable prices; that they are reasonably needed and will be used actually, directly and exclusively for solid waste management; and BOI of DTI approves the importation. (Sec. 45 b,1a)[37]

LGUs are also give the authority to collect solid waste management fees based on type of solid waste; the amount/volume of waste; and the distance of the transfer station to the waste management facility (Sec. 47. a,b,c).

However, LGU officials and officials of government agencies concerned who fail to comply with and enforce rules and regulations promulgated in RA 9003 shall be charged administratively in accordance with R.A. 7160 and other existing laws, rules and regulations (RA 9003 Sec 50).

5.1.4. Transportation and Transfer Stations[38]

Separate collection schedules and/or separate trucks or haulers are required for specific types of wastes. Otherwise, vehicles used for the collection and transport of solid wastes should have the appropriate compartments for efficient storage of sorted wastes while in transit (Sec 24).

Transfer stations shall be designed and operated for efficient waste handling capacity and in compliance with environmental standards and guidelines. However, no waste shall be stored in such station beyond 24 hours. To be considered for siting, the transfer station is the land use plan, its proximity to collection area, and accessibility of haul

[36] Cebu City, ordinance No. 2031, Nov. 10, 2004.
[37] Philippines, "RA 9003, The Ecological Solid Waste Management Act of 2000", 24 April 2009.
[38] Ibid.

routes to disposal facility. Sufficient size and space to accommodate waste for storage and vehicles for loading and unloading of wastes should be given primary consideration in designing a transfer station (Sec. 25)

The same tax and duty exemptions, rewards and incentives provided for collection equipment also applies to vehicles, equipment and machinery needed for transporting and storing waste materials.

Transport and dumping in bulk of collected domestic, industrial, commercial and institutional wastes in areas other than centers of facilities prescribed are prohibited acts (Sec.28, 13) and shall be punished with a fine of not less than P10,000.00 but not more than two hundred thousand pesos P200,000.00 or imprisonment of not less than 30 days but not more than three years, or both (Sec. 49.e)

5.1.5. Treatment

Pursuant to Sec. 33 of R.A. 7160, RA 9003 mandates through appropriate ordinances all provinces cities, municipalities and barangays, to consolidate, or coordinate their efforts, services, and resources for purposes of jointly addressing common solid waste management problems and/or establishing common waste disposal facilities (Sec. 44).

RA 9003 also provides for setting of guidance for proper treatment of wastes in appropriate and environmentally sound SWM facilities in accordance with ecologically sustainable development principles. Incineration is specifically excluded from the prescribed ecological waste management practices and technologies (Sec 2.c,d).

Appropriate waste processing technologies may also be considered provided that such technologies conform to internationally acceptable and other standards (Sec. 17.d). For instance, in sanitary landfills, pipes should be installed at the low areas of the liner to collect leachate for storage and eventual treatment and discharge (Sec. 41.b).

Failure of LGU officials and officials of government agencies to comply with and enforce rules and regulations promulgated RA 9003 shall be charged administratively in accordance with R.A. 7160 and other existing laws, rules and regulations (RA 9003 Sec. 50).

Incentives such as tax and duty exemptions, tax credits, financial assistance and grants apply to the establishment of waste management facilities (Chap. IV).

Criminal and administrative sanctions apply to violators of the law as prescribed in RA 9003 Chapter VI – Penal Provisions.

5.1.6. Disposal (Landfill and Incinerators)

The Philippines has one of the most stringent environmental laws with its total ban on incinerations. PD 1152 provisions on waste disposal, particularly on landfill and incineration have been superseded by the Clean Air Act which proscribe the use of incineration (Sec. 20) and later by RA 9003 (Sec. 2.d).

R.A. 7160 (Sec 33) and RA 9003 (Sec 44) both have provisions for the establishment of common treatment and waste disposal facilities.

For siting of sanitary landfills, minimum criteria include consistency of selected site with LGU land use plan, accessibility, and adequate quantity of earth cover material. The sentiments of the community's residents must also be considered. The site must not be located where it could affect environmentally sensitive resources such as aquifer, groundwater reservoir or watershed areas. It should have sufficient area for at least five years of operation. Chosen site should facilitate developing a landfill that will satisfy budgetary constraints, including site development, operation for many years, closure, post-closure care and possible remediation costs. The operating plans must include provisions for coordinating with recycling and resource recovery projects; and designation of a separate containment area for household hazardous wastes. (Sec.40) Other requirements in the sanitary landfill facility include liners, leachate collection and treatment system, gas control and recovery system, groundwater monitoring well system, daily and final cover, closure procedure and post closure procedure (Sec. 41).

Regulations and Standards for municipal solid waste disposal and final disposal facilities stipulated in DAO No. 98-49 "Technical Guidelines for Municipal Solid Waste Disposal" and DAO No. 98-50 - "Adopting the Landfill site Identification and screening criteria for municipal solid waste disposal facilities" have been superseded by the enactment of RA 9003 and the subsequent issuance of **DENR A.O No. 10 series of 2006** titled "Guideline on the Categorized on Final Disposal Facilities (Sanitary Landfill)".[39]

PD 1152 provides incentives to operate the installation and the utilization of pollution control facilities (Sec. 56). Eventually these provisions have been supplanted by updated stipulations in RA 9003 and RA 7160.

Both RA 7160 and RA 9003 have provisions that allow LGUs to create sources and revenue such as SWM fees. According to RA 7160, each local government unit shall exercise its power to create its own sources of revenue and to levy taxes, fees, and charges, consistent with the basic policy of local autonomy. Such taxes, fees, and charges shall accrue exclusively to the LGUs (Sec. 129). RA 9003 on the other hand, gives LGUs the authority to collect SWM fees. LGUs shall include only those costs directly related to the adoption and implementation of the plan and the setting and collection of the local fees (Sec. 47).

[39] Philippines, DENR A.O No. 10, "Guideline on the Categorized on Final Disposal Facilities (Sanitary Landfill)", 24 May 2009 ‹http://emb.gov.ph/nswmc/resources/DAO%2010.PDF›

PD 825 provides penalties for improper disposal of garbage and other forms of un-cleanliness. It has provisions for both persons (Sec 2.1) and juridical entities (Sec 2.2).

Under the IRR of RA 9003, administration and enforcement of the law shall be under the DENR Secretary or his duly authorized representative or through any other department, bureau, office, agency, LGUs, state university or college and other instrumentalities of the government for assistance in the form of personnel, facilities and other resources as the need arises in the discharge of its functions (Sec.5).

With the dismal turnout of compliance to targets prescribed by RA 9003, the DENR-National Solid Waste Management Commission (NSWMC) issued the Three-Strike Policy for LGUs still operating their open dumpsites and controlled disposal facilities. These LGUs are given six months within which to close these facilities otherwise an administrative case will be filed with the Department of Interior and Local Government.

Conditions for the first strike are continued operation of open dumpsites (ODs) or controlled disposal facility (CDFs); abandonment of rehabilitation and closure plan for OD or CDF; failure in implementing Authority-To-Close (ATC) that was issued by the EMB Regional Office for the proper rehabilitation and closure of the ODs and CDFs. In the First Strike, DENR/NSWMC issued Notification Letters to all non-complying LGUs citing as basis Section 37 of RA 9003, NSWMC Resolution No. 2005-05, and DAO 2006-09 -General Guidelines in the Closure and Rehabilitation of Open Dumpsites and Controlled Dump Facilities.

Second strike is given to LGUs who have not taken any course of action to comply. For the third strike an administrative case before the DILG or criminal action under Section 49, RA 9003 is filed against the concerned officials for failure to address the non-compliance.[40]

For individual disposal cases at the city level, citation ticket is issued by the Cebu Environmental Enforcement Team (CESET) for violating certain provisions of local and national SWM laws. There is a settlement fee of Php 500.00 to Php 5,000.00 to imprisonment of up to six months for the following violations:

Cebu City Ordinance No. 1361:

Title II Art. 3 – Failure to clean surrounding areas five meters from the nearest unenclosed residences, vendor stalls, and commercial establishments.
Title II Art. 5 – No proper waste receptacle of unclosed residences, vendor stalls and commercial establishments.
Title II Art. 8 – Spitting, urinating, defacating in public places.
Title II Art. 9 – Littering
Title II Art. 10 – Posting graffiti, posters, and handbills on walls.
Title II Art. 11 – Scattering garbage from receptacles.
Title II Art. 12 – No proper waste receptacle for animal drawn vehicles and non-collection animal discharges by owner.

[40] "NSWMC About Us", 26 May 2009, ‹http://emb.gov.ph/nswmc/programs.aspx›

Cebu City Ordinance No. 2031 Sec 8.

a) *Waste not properly placed in respective receptacles*
b) *Disposal of hazardous waste*
c) *Disposal of waste outside day of collection*
d) *Disposal of waste beyond time of schedule*
e) *Mixing of source separated waste.*

RA 9003:

- *Littering*
- *Non-segregation or improper segregation of wastes*
- *Improper use of bins and cans*
- *Use of Improper containers and bags*
- *Burning of waste*
- *Not following schedule of collection and disposal*

5.1.7. Reuse and Recycling

RA 9003 outlines the important features of a recycling program: the Inventory of existing markets for recyclable materials (Sec 26); the formulation of eco-labeling, a coding system for packaging materials and products to facilitate waste recycling and reuse (Sec. 27); the establishment of reclamation programs and buy-back centers for recyclables and toxics (Sec. 28); the inventory of non-environmentally acceptable products (Sec. 29); prohibition on the use of non-environmentally acceptable packaging (Sec.30); recycling market development (Sec 31); establishment of LGU materials recovery facility (Sec. 32); guidelines for establishment of materials recovery facility (Sec. 33).

The LGU's SWM plan will have a recycling component that shall include a program and implementation schedule showing methods by which the LGU shall reduce a sufficient amount of solid waste disposed of in accordance with the diversion. The recycling component shall describe the types of materials to be recycled, the methods to be used to determine types of waste to be diverted; the disposal through recycling, the new facilities; and expansion of existing facilities needed to implement the recycling component. It also describes the methods for developing the markets for recycled materials, including, an evaluation of the feasibility of procurement preferences for the purchase of recycled products. Each LGU may determine and grant a price preference to encourage the purchase of recycled products (Sec.17 f).
LGUs, private enterprises and NGOs shall enjoy fiscal incentives, non-fiscal incentives, financial assistance programs, and extension of grants and as applicable, for the establishment of waste management facilities such as those for recycling and recovery program (Chapter IV).

The NSWMC shall also provide incentives to businesses and industries that are engaged in recycling, registered with the NSWMC and have been issued ECCs. Such incentives shall include simplified procedures for the importation of equipment, spare parts, new materials, and supplies, and for the export of processed products (Chapter IV).

5.1.8. Resource Recovery

Section 20 of RA 9003 mandates the local government units to divert at least 25% of all solid waste from waste disposal facilities through re-use, recycling, composting, and other resource recovery activities within five years after the effectivity of the Act, which shall be increased every three years thereafter.

Every barangay or cluster of barangays shall set up a Materials Recovery Facility (MRF). The MRF shall receive waste for final sorting, segregation, composting, and recycling. The resulting residual wastes shall be transferred to a long-term storage or disposal facility or sanitary landfill (Sec 32).

The same set of incentives apply to resource recovery projects (Chapter IV) and range of penalties for violations thereof (Chapter VI).[41]

5.1.9. Summary

Table 3 summarizes the, regulations, economic instruments and enforcement measures on SWM in the country particularly in Cebu City. Gray areas identify policy gaps. As there are no specific policy in the country that provides for waste plastics management yet, gaps identified refer to provisions lacking that should generally apply to solid wastes, including plastics.

First is the source reduction provision, which gave time-bound targets which became a major stumbling block for LGUs. Upstream measures such as source reduction require the major involvement of the industrial and commercial sector, but this seems to have been unfairly handed over to LGUs lacking consideration of the LGUs capacities and resources needed to be able to comply. Source reduction entails a major shift of priorities from collection and disposal to green production and green consumption, which would take more than 5 years to mainstream.

Second is the lack of enforcement measures for reuse and recycling. Since these two are mainly informal sector activities at the LGU level, and currently largely undocumented except for a few community-based projects, LGUs at a loss on how to actually implement major LGU-led reuse and recycling programs. An emerging trend, given funding windows and promising technologies, waste to energy development is finally getting attention, especially with the passage of the Renewable Energy Act.

[41] Philippines, "RA 9003, The Ecological Solid Waste Management Act of 2000", 24 April 2009.

Table 3. Policies for Solid Waste and Waste Plastics (1/2)

LAWS/ACTS	REGULATIONS/STANDARDS	ECONOMIC INSTRUMENTS	ENFORCEMENT
Source Reduction			
RA 9003 Sec 20-targets 25% waste diversion in 5 years	RA 9003 Sec 2- guidelines and targets should be set at the local SWM plans City Ord. 2031- set guidelines and targets for waste reduction	Sec 45-rewards will be given to outstanding projects Sec 49- sets fines for violations	RA 9003 Sec 48-prohibits manufacture of non-environmentally acceptable materials Sec 49- sets fines for violations
Segregation of waste at source			
RA 9003 Sec 21-sets minimum requirements for segregation City Ord. 1361-no segregation, no collection policy	RA 9003 Sec 21-sets minimum requirements for segregation	RA 9003 Sec 49- sets fines for violation CESET Citation Ticket-fines for violators	RA 9003 Sec 48-non segregated waste prohibited Sec 49- sets fines for violation CESET Citation Ticket-fines for violators
Primary Storage and Collection			
RA 9003 Sec 48- collection of non-segregated waste prohibited City Ord. 2031- requires waste segregation at source	RA 9003 Sec 17-sets revision of building ordinances to comply with RA 9003 SWM Sec 23- sets minimum standard requirements for storage and collection	RA 9003 Sec 49- sets penalties for violations Sec 47- LGUs allowed to collect SWM fees RA 9003 Sec 45- Tax exemption and incentives to SWM equipment, vehicles CESET Citation Ticket-fines for violators	RA 9003 Sec 50-administrative cases for non-complying LGU officials CESET Citation Ticket-fines for violators
Transportation and Transfer Station			
RA 9003 Sec 24-segregated collection and transfer	RA 9003 Sec 25- sets minimum standards for siting transfer stations	RA 9003 Sec 29- sets fines for violations	RA 9003 Sec 29- sets fines for violations
Treatment			
RA 9003 Sec 44- requires local coordination for SWM problems and common disposal facilities	RA 9003 Sec 2c,d –mandates setting of guidelines for proper and ecological treatment of wastes Sec 17- consider acceptable waste processing technologies Sec 41- states minimum requirements for sanitary landfill	RA 9003 Chap IV-sets incentives for SWM projects Chap VI- sets sanctions for violators	RA 9003 Chap VI- sets sanctions for violators
Incinerators			
RA 8749 Sec 20 and RA 9003 2d –bans incinerators		RA 7160 Sec 129 and RA 9003 Sec 47-allows LGU to create revenue sources from SWM PD 825 Sec 2-provides penalties for improper disposal of garbage	IRR Sec 5- DENR Secretary or representative or any instrumentalities of government concerned will enforce RA 9003

Table 3. Continuation (2/2)

LAWS/ACTS	REGULATIONS/STANDARDS	ECONOMIC INSTRUMENTS	ENFORCEMENT
Landfills			
RA 1760 Sec 33 and RA 9003 Sec 44- setting of common disposal facilities	RA 9003 Sec 40- sets minimum standards for disposal facilities Sec 41- sets other requirements for sanitary landfill DAO 06-10-sets guidelines for final disposal facilities pursuant to RA 9003	RA 7160 Sec 129 and RA 9003 Sec 47- allows LGU to create revenue sources from SWM PD 825 Sec 2-provides penalties for improper disposal of garbage	IRR Sec 5- DENR Secretary or representative or any instrumentalities of government concerned will enforce RA 9003 Three Strike Policy- warnings to non-complying LGUs
Reuse and Recycling			
Sec 26- inventory of markets for recyclable materials Sec 27- eco-labeling Sec 28- establishment of reclamation programs Sec 29-inventory of non-environmentally acceptable products Sec 30- development of recycling market Sec 31- establishment of MRFs RE Act: regulations and incentives	RA 9003 Sec. 33- set guidelines for MRFs	RA 9003 Sec 17-LGU may determine and grant incentives to encourage purchase of recycled products Chap IV – Incentives for SWM projects RE Act	
Resource Recovery			
RA 9003 Sec 20- 25% diversion of waste from recycling facilities through resource recovery activities RA 9003 Sec 32- set up MRFs		RA 9003 Chap IV – Incentives for SWM projects RE Act incentives to renewable energy (applicable to biomass, mixed waste and waste plastics conversion to energy	

5.2. Institutions

Solid waste management is no longer the sole responsibility of local governments. Actors in the solid waste management chain have become engaged stakeholders, involved not only in their specific concern in waste management but also in responding to problems, issues and requirements in improving the system and engaging proactive initiatives for source reduction, recycling, recovery and abatement of pollution. More and more public services, including waste management are being privatized. Thus the government should establish strong regulatory institutions to ensure that service providers are effectively and efficiently delivering their services.

This part presents basic information on the public and private institutions currently responsible at different levels of the solid waste management chain. It outlines their roles and mandate, institutional framework, and human resources and sources for financing. The institutions are presented as public institutions under which national government agencies (NGAs) and LGUs are categorized, and private institutions that include NGOs and private enterprises. International organizations are discussed separately at the last part of this segment.

5.2.1. National Government Agencies

5.2.1.1. Department of Natural Resources (DENR)[42]

The DENR is the mandated to be the primary agency responsible for the conservation, management, development, and proper use of the country's environment and natural resource the following objectives:

1. *Assure the availability and sustainability of the country's natural resources through judicious use and systematic restoration or replacement, whenever possible;*
2. *Increase the productivity of natural resources in order to meet the demands for forest mineral, and land resources of growing population;*
3. *Enhance contribution of natural resources for achieving national economic and social development;*
4. *Promote equitable access to natural resources by the different of the population;*
5. *Conserve specific terrestrial and marine areas representative of the Philippine natural and cultural heritage for present and future generations.*

Core Functions[43]

1. *Formulate and implement policies, guidelines, rules and regulations relating to environmental management, pollution prevention and control;*
2. *Formulate, implement and supervise the government's policies, plans and programs pertaining to the management, conservation, development, use and replenishment of the country's natural resources and ecological diversity; and*

[42] DENR Mandate, June 10, 2009 ‹http://www.denr.gov.ph/about›
[43] Ibid.

3. Promulgate and implement rules and regulations governing the exploration, development, extraction, disposition, and use of the forests, lands, minerals, wildlife and other natural resources.

The Department is headed by a Secretary, assisted by Undersecretaries and Assistant Secretaries. It has several bureaus and attached agencies. For SWM concerns, the NSWMC is the lead organization.

The National Government appropriates part of the annual budget to the DENR. As of 2009, the DENR budget increased 51.2 percent from P8.5 billion to P12.8 billion[44]. Among other sources of funds are direct revenues from fees, fines and penalties. Its programs and projects are implemented through the support of international funding agencies, grants and aids.

5.2.1.2. National Solid Waste Management Commission (NSWMC) [45]

The NSWMC is the major agency tasked to implement RA 9003. The law signed in January 26, 2001, calls for the institutionalization of a national program to manage the control, transfer, transport, processing and disposal of solid waste in the country. Chaired by the DENR, the NSWMC prescribes policies to effectively achieve the objectives of RA 9003. It oversees the implementation of appropriate solid waste management plans by end-users and local governments.

Institutional Framework
The NSWMC's framework reflects, among others, the assessment of the solid waste situation, analysis of options, mandatory program of action, public participation and IEC campaign and aspects for the standardization and measuring performance in relation SWM. (RA 9003 IRR Sec.1)

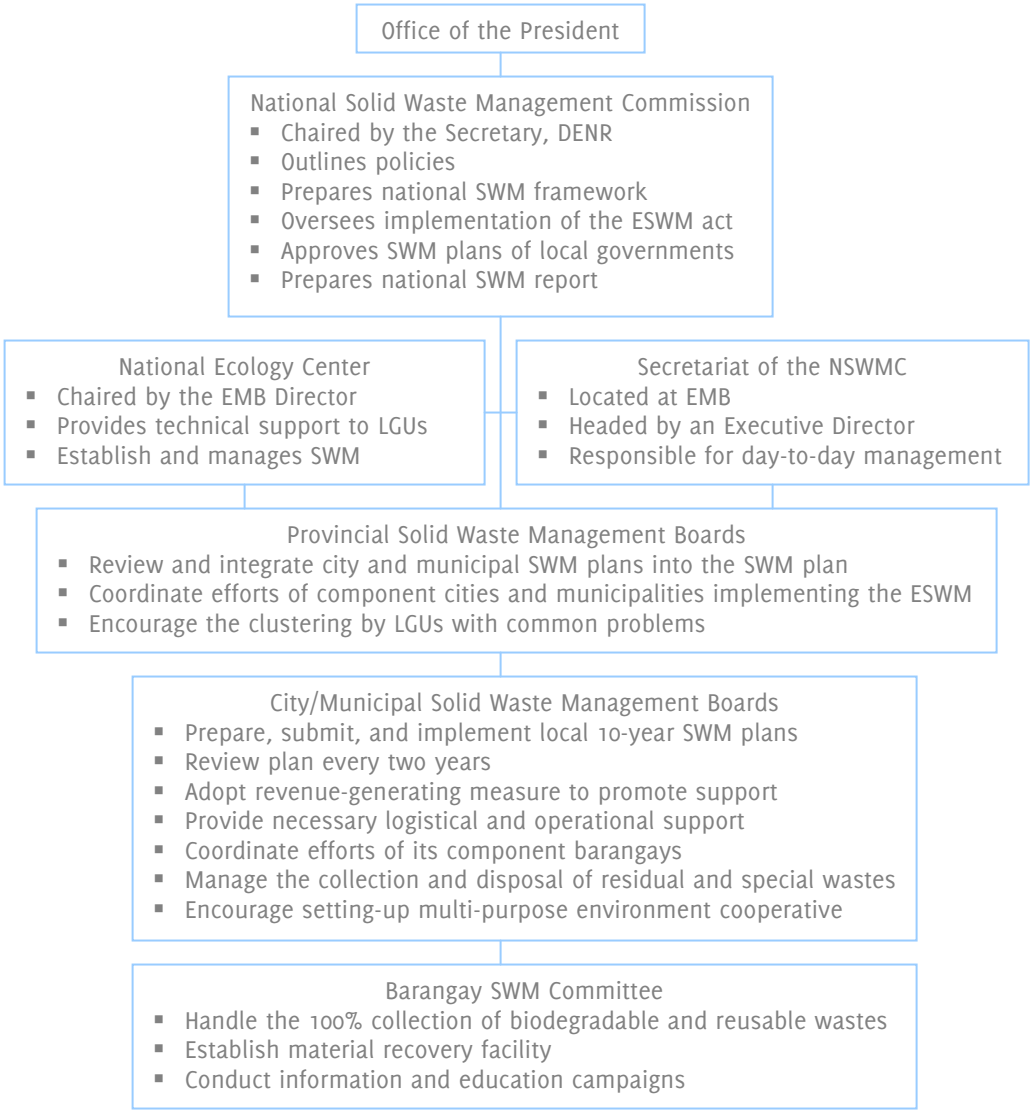
The NSWMC shall be composed of 14 members from the government sector and three members from the private sector. It will oversee the implementation of appropriate solid waste management plans by end-users and local governments as mandated by law. The Commission is also ordered to establish the National Ecology Center (NEC), which will serve as the depot of information, research, database, training, and networking services for the implementation of the provisions of the solid waste management act (Sec 2).

Source of Funding
RA 9003 provides the establishment of the National Solid Waste Management Fund, a special account in the National Treasury, administered by the NSWMC. It

[44] "Arroyo to sign 2009 budget by mid-March - Palace exec", 22 May 2009 ‹http://www.gmanews.tv/story/151382/Arroyo-to-sign-2009-budget-by-mid-March---Palace-exec›
[45] Philippines, "RA 9003, The Ecological Solid Waste Management Act of 2000", 24 April 2009.

is a catalytic fund, which shall initiate bigger and wider SWM engagements in the future (Sec 46). It also receives part of the annual appropriation to DENR.

Figure 3. Organizational Structure of the NSWM Commission



Source: World Bank Philippines Environment Monitor 2001.

5.2.1.3. Department of Interior and Local Government (DILG) [46]

DILG's mandate is empowering LGUs to deliver effective and efficient public service. Its mission is to promote peace and order, ensure public safety and strengthen capability of local government units.

The DILG is divided into two the Interior and the Local Government Sectors. The interior sector in charge of the police, fire protection, jail management and the Philippine Public Safety College. On the other hand, the local government sector is composed of the bureaus, offices and support services that deals with local government, local development, barangay operations, public affairs, the Local Government Academy and the Planning, Financial Management, Legal, Electronics Data Processing and Administrative Services.

Powers and Functions
The Department is designated to 'assist the President in the exercise of general supervision over local governments; advise the President in the promulgation of policies, rules, regulations and other issuances on the general supervision over local governments and on public order and safety; establish and prescribe rules, regulations and other issuances implementing laws on public order and safety, the general supervision over local governments and the promotion of local autonomy and community empowerment and monitor compliance'.

It shall plan, coordinate and organize policies and programs for local governments. Another important function is to organize, train and equip primarily for the performance of police functions, a police force that is national in scope and civilian in character.

The Department shall be headed by the Secretary supported by the Offices of Under-Secretaries and Assistant Secretaries and the Support Service Offices.

Sources of Funding
According to the IRR of RA 7160, the budget of the DILG is from the General Appropriations Act (Sec 107). For 2009, the DILG Budget is at P62 billion[47].

5.2.2. Local Government Units

Territorial and political subdivisions of the Republic of the Philippines are the provinces, cities, municipalities, and barangays.[48] The barangay is the smallest unit of government; groups of barangays constitute a city or municipality. The province is the highest form of local government. The Local Government Code empowers provinces to exercise general

[46] "DILG Primer", 19 June 2009, < http://www.dilg.gov.ph/attachments/0000/0512/PRIMER.pdf
[47] "Arroyo to sign 2009 budget by mid-March - Palace exec", 22 May 2009, <http://www.gmanews.tv/story/151382/Arroyo-to-sign-2009-budget-by-mid-March---Palace-exec>
[48] "The 1987 Philippine Constitution", 4 May 2009, <http://www.pcij.org/blog/wp-docs/1987-Philippine-Constitution.pdf>

supervision over their component cities and municipalities. Highly urbanized and independent component cities are not under the supervision of the province, such as the case of Cebu City.

Institutional mechanisms provided by RA 9003 for the role of LGUs in SWM are in consonance with relevant provisions of RA 7160. Both laws direct LGUs to be the primary institution responsible for the implementation and enforcement of the provisions of this RA 9003 within their respective jurisdictions.

In particular, segregation and collection of solid waste shall be conducted at the barangay level specifically for biodegradable, compostable and reusable wastes, while the collection of non-recyclable materials and special wastes shall be the responsibility of the municipality or city (Sec 10).

There are three levels of local government and each have their own functions and specific solid waste management units established to plan, implement and enforce RA 9003.

In terms of solid waste management, the engagement of the different levels of local government units could be briefly summarized as follows:

Table 4. Local Government Units in Solid Waste Management

POLICY	PLANNING	IMPLEMENTATION	ENFORCEMENT
Provincial Level			
Provincial Council	Provincial Planning and Development Office	-Integration, coordination and monitoring only -Actual implementation and enforcement at city and barangay level	
Provincial Solid Waste Management Board			
City Level			
City Council	City Planning and Development Office	Department of Public Services	-Local Police -Deputized of regular enforcement groups such as CESET
City Solid Waste Management Board			
Barangay Level			
Barangay Council	Barangay Planning Committee	Barangay Environmental Office	-Brgy. Tanods/Eco-Aide Units
Barangay Solid Waste Management Committee			

Source of Funding

The Local Government Code specifies the allocations to LGUs from national taxes. The regional distribution of the annual Internal Revenue Allotment (IRA) from the national government to local governments is at 23% for provinces, 23% for cities, 34% for municipalities, and for barangays, 20%. (Sec. 285).

The main sources of local government income are tax and non-tax revenue and income from external sources. Provinces are the most dependent on revenue from external sources, followed by municipalities, then cities. The IRA is the major

external source of income for LGUs. Of the total IRA received by municipalities and provinces, almost 60-70% is allocated for personnel services, 20% for the economic development fund (EDF) and the rest for maintenance and operating expenses and capital outlay. With a very limited LGU EDF, SWM activities will have to compete with other contending priorities.[49]

5.2.2.1. Provincial Level

A Provincial Solid Waste Management Board (PSWMB) shall be established in every province, to be chaired by the Governor. All mayors of its component cities and municipalities shall sit as members of Board. Other members include a representative of the *Sangguniang Panlalawigan*, the provincial health and/or general services officers, whichever may be recommended by the governor, the provincial environment and natural resources officer; the provincial engineer; congressional representative/s from each district; a representative of the environmental NGO sector; a representative each from the recycling industry, manufacturing or packaging industry, and each concerned government agency possessing relevant technical and marketing expertise as may be determined by the Board. Other concerned agencies or sectors may be call be called by the Board as necessary, provided that private sector representatives are selected within themselves and endorsed by the government agency representatives of the Board (Sec.11).

Major functions and responsibilities of the PSWMB include the following (Sec. 11):

- Develop an integrated provincial SWM plan from the plans of component cities and municipalities to be submitted to the NSWMC
- Provide the necessary logistical and operational support to its component cities and municipalities
- Recommend anti-pollution safeguards and measures to generate resources, funding and implementation of SWM projects and activities
- Identify areas with common SWM problems and appropriate units for planning local SWM services, and allow for the clustering of LGUs for the solution of common SWM problems.
- Coordinate local efforts in implementing the Provincial SWM Plan
- Oversee and review the implementation of the Provincial SWM Plan
- Develop appropriate incentive schemes for SWM stakeholders

As a chartered city, Cebu City no longer functions under the jurisdiction of the Provincial Government. Such is also the case with SWM in the city.

5.2.2.2. City/Municipal Level

[49] Making RA 9003 Work: Putting Real Issues, Real Solutions in a Real World: A Joint Policy Position Paper of the League of Cities of the Philippines and League of Municipalities of the Philippines, Elmer Mercado, LGU Policy Advisor, January 2006 ‹ http://zunia.org/uploads/media/knowledge/Making%20RA%209003%20Work.pdf›

According to R.A 7160, the city, consisting of more urbanized and developed barangays, serves as a general purpose government for the coordination and delivery of basic, regular, and direct services and effective governance of the inhabitants within its territorial jurisdiction. This provides the foundation of the city's role in solid waste management (Sec 448).

City Government

Cebu City is classified as a highly urbanized city and independent of the Cebu province. Under the RA 7160, the city has the power and authority to establish an organization that shall be responsible for the efficient and effective implementation of its development plans and programs. The city government follows the structure prescribed by the law. It is headed by the City Mayor. Under him are all the departments and offices as required to be established under the Local Government Code and all other offices created by the city council to implement its plans or priority programs and projects.

The City Government is empowered within its jurisdiction to ensure and support, among other things, the promotion of the people's health and safety and the enhancement of the right of its people to a balanced ecology.

Human Resources

Based on Section 76 of the Local Government Code every local government unit shall design and implement its own organizational structure and staffing pattern taking into consideration its service requirements and financial capability, subject to the minimum standards and guidelines prescribed by the Civil Service Commission. [50]

City Solid Waste Management Board (CMSWMB)

Mandated by RA 9003, Cebu City formed the CMSWMB that shall prepare, submit and implement a plan for the safe and sanitary management of solid waste generated in areas under its jurisdiction. The CSWMB is composed of the city or municipal mayor as head with the following as members: a representative of the *Sangguniang Panlungsod* or the *Sangguniang Bayan*, preferably chairpersons of either the Committees on Environment or Health, who will be designated by the presiding officer; President of the Association of Barangay Councils in the municipality or city; Chairperson of the *Sangguniang Kabataan* Federation; the same set of private sector representatives as in the PSWMB also selected by and within their sector; and a representative of each concerned government agency possessing relevant technical and marketing expertise as may be determined by the Board (Sec. 12).

[50] "Local Gov't Code of the Philippines", 29 May 2009, ‹http://www.pcij.org/blog/wp-docs/LGC1991.pdf›

The CSWMB is mandated to perform the same functions as their provincial counterpart, but only as applicable within their geographical and political coverage. Specifically, their major functions include the following (Sec.12):

- Prepare, submit and implement local ten-year SWM plans and develop specific mechanics and guidelines for its implementation
- Review plan every 2 years and monitor its implementation
- Adopt revenue generating measures to promote support
- Provide necessary logistical and operational support
- Coordinate efforts of its component barangays
- Manage the collection and disposal of residual and special wastes
- Encourage setting up of Multi-purpose Environmental Cooperatives

Department of Public Services (DPS)[51]

The Department of Public Services was created to effectively address the City's worsening problems on solid waste management and disposal, street cleaning, street lighting, inadequate potable water supply and the repair and maintenance of garbage trucks.

The DPS envisions making Cebu City the cleanest and most orderly City in the South through observance and implementation of a sound Clean and Green Program, through the accomplishment and carrying out of basic services to the public, sensitive to its changing needs at the fullest extent of collective efforts and capabilities with the barest minimum cost to the City Government.

Department Services

1. Cleans city streets of dry garbage, painting of curbs and gutters and center islands, trimming of grasses on sidewalks and the removal of silts on side streets.
2. Manages street beautification, thoroughfares and boulevards around the city.
3. Maintains, repairs and rehabilitates the functional waterworks in the city.
4. Constructs reservoir and installs pipelines for barangay water systems.

Department Divisions

1. Street Cleaning Division
2. Garbage Collection and Transport Operation Division
3. Administrative Division

Funding

City Ordinance 2017 provides annual appropriation of one million pesos to the Board for its creation, operation and maintenance.[52]

[51] "Department of Public Services", 10 April 2009, http://www.cebucity.gov.ph/Index.php?pageno=6&cluster=1&dept=10
[52] Cebu City, "Ordinance No. 2017" 12 May 2009.

Cebu Environmental Sanitation Enforcement Team (CESET)

CESET is the city's main arm for enforcing the provisions of national and local solid waste management laws. The CESET Program was recently awarded by the DENR for mobilizing the participation of communities in enforcing environmental laws. With the active CESET, the city observed is a marked improvement in waste collection. Its personnel issues citation tickets to SWM violators[53].

5.2.2.3. Barangay Level

Section 7 of the RA 9003 IRR specifies the composition and membership of the Barangay Solid Waste Management Committee (BSWMC): *barangay* captain as chair with the following as members: one *Kagawad, Sanggunian Kabataan* Chair, presidents of home owners associations; public/private school principals or representative; one Parents and Teachers Association president or representative; one religious organization representative; one business community representative; one environmental NGO representative; President of Market Vendors Association; and a representative from junkshop owners` association (IRR Sec.7).

The BSWMC shall have the following functions and responsibilities (Sec. 6):

- Formulate solid waste management program consistent with city municipality plan
- Segregation and collection of biodegradable, compostable, reusable wastes
- Establish materials recovery facility
- Allocate barangay funds; look for sources of funds
- Organize core coordinators
- Submit monthly report to city or municipality

5.2.3. Non-government Organizations

5.2.3.1. Kaabag sa Sugbu[54]

Kaabag sa Sugbu is a network of social development NGOs. It was formed in 1992 as a unified and organized coalition to assist in the development of the City. Currently, it has twenty-three member NGOs and two NGO observers. It has five active committees focused on specific issues and concerns:

- Committee on the Environment – tackles issues on water, solid waste management, oil exploration and other issues concerning the environment
- Human Rights Committee-aims to address human rights issues

[53] Cebu City, State of the City Address Mayor Tomas R. Osmeña (07/03/2006) June 23,2009 ‹http://www.cebucity.gov.ph/Index.php?pageno=21›
[54] Dela Pena, J. "Kaabag sa Sugbo, A Network of Social Development NGos in Cebu", Cebu City, December 3, 2008.

- Governance Committee-focuses on th formulation of barangay development plans, tackles issues on charter change, election concerns and all other issues on governance
- Poverty reduction committee- engages issues on housing, livelihood and income generating projects
- Women, Children and Family Committee- hopes to promote gender awareness in all NGOs and address issues on Children in Conflict with the Law as well as respond to the issues concerning women

Vision and Mission
Kaabag's vision for Cebu is 'a unified Cebu which is livable, equitable and sustainable.' Organizationally, its vision is to be a network of Cebu-based NGOs effectively advocating for sustainable development agenda through participation in local governance.

Programs and Projects
Aside from coordination and networking between member and non-member NGOs, local government units, local offices of national government agencies and interest groups of various sectors, the network holds specific projects based on the focus of the committees. The Environment Committee has seven active member organizations that focus on various ecological concerns, such as solid waste management.

Source of funding
Major funding for Kaabag operations comes from Misereor and the smaller funds for minor activities are pooled together by member organizations. Kaabag also seeks funds for specific projects from other local and international funding agencies.

Kaabag sa Sugbu's Board is composed of heads of member NGOs. The Secretariat is composed of four staff and the Executive Director is Ms. Jacque dela Pena. Among Kaabag sa Sugbu's members that are active in environmental and solid waste management projects in Cebu City include:

5.2.3.2. Philippine Business for Social Progress (PBSP)[55]

PBSP is committed to the empowerment of the poor by promoting business sector leadership in, and commitment to, poverty reduction programs that lead to self-reliance. PBSP's guiding principle is "Helping People Help Themselves."

Programs and Projects
PBSP's programs are clustered under Four Pillars: Poverty Alleviation, Corporate Citizenship, Information Technology Building and Leadership in Corporate Social Responsibility (CSR)[56].

[55] "Phil. Business for Social Progress (PBSP)", 1 July 2009, ‹http://pbsp.org.ph/›
[56] "PBSP Programs", June 11, 2009 ‹http.www.pbsp.org.ph/programs.htm›

The PBSP program relevant to waste to energy projects is the Membership and Corporate Involvement Program. Through this, PBSP can encourage member industries to pool in their waste plastics to be the raw materials for the conversion facility that will be installed. Under the Technology Management Program, a waste conversion demonstration facility can be managed appropriately. With their Strategic Private Sector Partnership for Urban Poverty Reduction, major funding may be sourced and/or accessed for setting up the facility.

Human Resources
The National Chairman is Manual V. Pangilinan representing PLDT. The Board is composed of representatives of elected member organizations.

Linkages
PBSP works with government, business, NGOs, donor institutions and poverty groups through multi-sectoral partnerships in seeking to contribute to nationwide poverty alleviation. The Foundation adopts various strategies in the pursuit of meaningful, effective and sustainable change.

Funding Sources
PBSP funding comes from membership dues, special donations and project-specific funding from member organizations. It also sources grants from international funding institutions.

5.2.3.3. Gagmay'ng Kristohanong Katilingban Lihok-Pagtinabangay Multi-Purpose Cooperative (GKKLPMPC), a non-stock, non-profit foundation organized and existing under and by virtue of Philippine laws with office address at Barangay Inayawan, Cebu City.

Institutional Framework
GKKLPMPC Inc. is a private foundation that undertakes the role of building communities in depressed areas with the primary objective of becoming a catalyst in uplifting the quality of life of the poor through the organization, support, and capability of scavengers at the Inayawan landfill located in Cebu City. GKKLPMPC is active in waste recovery in the landfill but they do not have the proper gear and equipment to ensure their safety inside the landfill area.

The cooperative is headed by Mrs. Lilia r. Llanto, Chairwoman. It has about three hundred members, most of whom are waste pickers at the Inayawan Landfill. It is the most active group of waste pickers in the province. As a cooperative, majority of funding comes from capital build-up from cooperative members, membership dues and income from the cooperative's business activities.

5.2.2.4. Cebu Business Park and Neighbouring Barangays Altruistic Alliance (CBPNBAAI)[57] The CBPNBAAI is an alliance between Cebu Holdings Inc. (CHI), the commercial establishments in the Cebu Business Park area and the communities around Cebu Business Park covering five barangays.

The Alliance believes that they are "*building a larger community of people with varied resources, yet common and collective in goals and aspirations. This is an alliance built on trust, a bonding based on respect.*" With this they created a solid waste management program wherein the communities will benefit from the waste of the commercial establishments. The program aims to address social concerns by generating employment and livelihood opportunities through waste segregation and collection.

Resource Pooling
The cost and expenses on garbage collection project, being a joint project undertaken by the alliance, CHI and CBPAI, are shared among the group. CHI and CBPAI shouldered the cost of the garbage trucks while the alliance represented by Barangay Luz, spends for fuel, manpower and truck maintenance. Eventually the program gained enough income to keep it going.

With "*Kwarta sa Basura* (Cash from Trash)", the community savings strategy of the alliance implemented by Barangay Luz, much of the waste is converted to cash after selling to recyclers. Some waste is processed into saleable products such as bags, slippers and decorative items. The rest are brought to the composting facility within the CBP.

While the women recycle and process waste, the men, who are members of the Empowerment, Reaffirmation of Paternal Ability Training (ERPAT), manage a 96-square meter composting facility located at the eastern part of the CBP. For waste collection, the alliance was able to employ 15 residents to load and sort segregated garbage.

5.2.2.5. Lihok Pilipina Foundation, Inc.[58]
Lihok Pilipina efforts started in 1985 as a project of Pilipina - Cebu Chapter and later evolved a social credit program for women. It envisions communities that are dynamic, non-violent, viable, effective, militant and self-reliant where the dignity and quality of life of women, children and men are upheld and continuously developed. *Lihok Dilipina* is working for the society's acceptance of the central significance of women's perspective in the national struggle for social transformation.

[57] "Our Community Beyond Our Fencelines" 20 May 2009, ‹http://www.cebuholdings.com/ViewOurcommunity.do›
[58] "Lihok Pilipina Inc. About Us", 25 May 2009, ‹http://www.lihokpilipina.com/programs.php›

The organization later evolved a community waste management project called *Katilingbanong Pagdumala Sa Biya* (KPB). The KPB project is focused on organizing communities to respond to barangay waste management problem. With initial funding from Cebu–Partners Committed to Environmental and Economic Management (Cebu–PCEEM), the project was piloted in five barangays in Cebu City on October 2001, which included barangays Calamba, Labangon, TIsa, Sambag I and Sambag II.

In 2003, with financial assistance from Cebu City Government, KPB has expanded to six new areas, namely: barangays Ermita, Kamagayan, Pahina Central, Pahina San Nicolas, Pasil, and San Nicolas Proper.

They established Area Task Forces to sustain the project. The Task force started buying of recyclables, facilitated orientations within the barangays, scheduled greening, cleaning and composting activities in the barangay, and attended coordination meetings as well as capability building seminars and trainings.

With the continuous buying of recyclables in their areas, KPB has established a total of 21 entrepreneurs. Some of these entrepreneurs are members of the Task Force who ventured into scrap buying and now are finding an additional source of livelihood, while others are junk shop businessmen within the barangays who are supporting the project.

An environmental cooperative is also created in the five pilot areas. The cooperative serves as depositary of the savings earned by its members from scrap buying. They plan to use the collective savings of the members as the rolling fund for their microfinance project from where their members can access loans for livelihood capital.

KPB project also organized the *Bahandi Sa Kinaiyahan*, a 'toys-and-products-from waste' contest which is held annually on April in time for the celebration of the Earth Month. Started in April 2002, it shows the meaning of caring for the environment, creating and inventing toys and products from waste.

In addition, the KPB project also initiates rip-rapping of canals and river clean ups in the areas. Further, the project encourages its members to come up with products from waste that they can sell for additional income. A number of products from waste are now gaining market. Among them, baskets out of used tetra packs, table decors from rolled telephone paper and baskets from woven newspapers.

5.2.4. Private Enterprises

There are quite a number of private entities engaging in different phases of the SWM chain in the city. However, most of them are unlisted and unwilling to be interviewed.

5.2.4.1. Man-Tech Management Services Corp.

Role and Mandate

Man-tech Management Services Corporation is a private enterprise engaging in the business of hauling of garbage within the Metro Cebu. Man-Tech provides solid waste collection services to customers in the City, ranging from residential subdivision to large commercial customers requiring comprehensive, one source waste programs.[59]

Institutional Framework

Man-Tech is strongly committed to a foundation of operating excellence and professionalism, the company actively pursues projects, initiatives, and commitment to the preservation of our environment and the protection of valuable resources. Man-Tech management functions to make a positive difference for the environment in every aspect of its business.[60]

Mantech's owner and general manager is Mr. Totsie Yang. The capital was raised by the owner and income is from clients of their hauling contracts.

5.2.4.2. Plasironcan Trading[61]

Plasironcan is a company engaged in recycling wastes like plastics, cartons, tin cans, etc. It is located at Pier 4, Osmena Blvd., Cebu City. Plasironcan have started operation in year 2000. It started as a small junkshop and is now one of the biggest suppliers of scrap materials such as hi-impact, PS, HD, PE, PP, cellophane plastic, among others. It is currently trading recyclables locally but is looking forward to engage products for export.

Business Type	:	Trading Company
Product	:	Selling Plastic, Iron, Tin, Aluminum, Carton
Number of Employees	:	11 - 50 People
Main Markets	:	Southeast Asia
Total Annual Sales Volume:		Below US$1 Million
Factory Size	:	1,000-3,000 square meters

5.2.4.3. Cebu Ace Trucking Corporation[62]

CATC is a private transporter registered with the DENR. It is located in Dr.F.E. Zuellig St., Reclamation Area. It is licensed to transport the following:

- waste with inorganic chemicals (D401-D499),

[59] Man-Tech Company Profile, 2009
[60] Ibid.
[61] "Plasironcan", 12 April 2009, ‹http://www.alibaba.com/member/plasironcan/aboutus.html›
[62] "Cebu Ace Trucking Corporation" 15 April 2009, ‹http://www.ilink.ph/view.php?id=1658›

- waste with organic solvent (G703-G704) and
- waste oil/bunker sludge (I101)

CATC offers heavy equipment rentals, trucking services, heavy lift services & transportation hauling of containerized and loose cargoes, warehouse rental and services, container van and trailer rental, container yard services, mineral logistics and iso-tank steam washing. Their funds come from their bbusiness operations.

5.2.5. International Organizations

Most international cooperation on solid waste management does not focus on only one phase of the management system but instead are holistic programs that include upstream and downstream measures.

5.2.5.1. Canadian International Development Agency[63]

CIDA is Canada's lead agency for development assistance. Its mandate is to support sustainable development in developing countries to reduce poverty and contribute to a more secure, equitable and prosperous world.

CIDA reports to the Canadian Parliament through the Minister of international cooperation

CIDA-AIT Partnership SEA-UEMA Project[64]
The SEA-UEMA Project is a partnership between the Canadian International Development Agency (CIDA) and the Asian Institute of Technology. Its goal is to contribute to the improvements of urban environmental conditions in Southeast Asia. It seeks to attain improved implementation and sharing of sound urban environmental management policies and practices. The focus of the project is on three key urban environmental sub-sectors, water and sanitation, solid waste and air pollution, with poverty reduction and gender equality as the two crosscutting themes. The projects two key components are UEM Graduate Education, and UEM Applications and Networks.

Setting MRF in urban local authorities through a participatory process, a flagship project of the ADB Continuity Project. Among its projects in Cebu are:

- Capacitating Community for ecological Sanitation and Improved Domestic Waste Management.
- Community Rainwater Harvesting, in "*Budlaan* II Amazing *Gawad Kalinga* Village" Relocation Project

[63] "About CIDA"' 12 July 2009, ‹ht://acid-cida.gc.ca/cidaweb/acdicida.nsf/En/NIC-5313423›
[64] SWAPP, "Solid Waste Management Association of the Philippines", 22 June 2009 ‹http://swapp.org.ph/?option=com_content&task=view&id=25&Itemid=11›

5.2.5.2. New Japan International Cooperation Agency (JICA)[65]

The New JICA was officially inaugurated on October 1, 2008 with a merger between the existing JICA and the overseas economic cooperation section of the Japan Bank for International Cooperation (JBIC). It is the world's largest bilateral development assistance agency with a size of estimated $10.3 billion dollars. With the merger, it has become the one stop shop of Japan's Official Development Assistance and provide technical assistance, concessionary loans, and grant aid.

New JICA will enhance the impact of assistance through a more strategic framework that focuses on medium to long term development goals. It will provide more predictable aid by operational "rolling plans of candidate projects for individual developing countries. It will have speedier project formulation through preparatory surveys. Finally, assistance will be tailored to real needs as it now has the mandate to synergize three aid schemes: Grant Aid from the Japan's Ministry of Foreign Affairs, Technical Cooperation of the old JIA and the ODA loans from JBIC.

Inclusive and Dynamic Development encapsulates the New JICA's vision. This vision represents a development approach that encourages people to recognize issues, participate in addressing them and enjoy the result of such efforts. The vision also means that JICA will 'provide creative highly effective support toward this end, at times moving swiftly and at times acting from the longer-term perspective as the situation calls for'.

The New JICA endeavours to address the global agenda, reduce poverty through equitable growth, improve governance and achieving human security. Its strategies include integrated and seamless assistance, promoting development partnerships, enhancing research and knowledge-sharing.
The New JICA is headed by Mrs. Sadako Ogata who was President of "old JICA" since October, 2003. In addition to the headquarters in Tokyo and 17 domestic offices, JICA has a network of 96 overseas bureaus and has undertaken projects in around 150 countries. It has 1,664 staff who are supplemented by thousands of Japanese experts and young and senior volunteers on both short-term and long-term contracts.

Table 5. Comparison with other Major Donor Agencies

	NUMBER OF STAFF	VOLUME OF OPERATION
World Bank	8,600	US$19,634 M
Asian Development Bank	2,443	US$6,851M
United States Agency for International Development	2,227	US$3,976 M
New JICA	1,664*	US$10,280 M

Exchange Rate used: JPY100.10/US$ (IFS rate for 2008 March end)
*estimated based on FY2008 budget (full year)
Source: The New JICA Facts and Figures ‹http://www.jica.go.jp/english/news/field/2008/pdf/081003.pdf›

[65] "JICA Facts and Figures" 8 July 2009, ‹http://www.jica.go.jp/english/news/field/2008/pdf/081003.pdf›

In the Philippines, one of JICA's projects is a study on the Recycling Industry Development. The study is a project of the BOI-DTI and is fully supported by the NSWMC, and the private sectors, specifically recyclers of glass bottles, metals, papers, plastics and electronic wastes. Under RA 9003, DTI is mandated to help develop the recycling program in the country through the development of markets for recyclable materials.

The Recycling Study aims to formulate a Master Plan and Action Plan that would clarify the policies, measures and actions to be taken by the Government to further promote and develop the recycling industry in the Philippines to achieve the objective of solid waste management under the law as well as to realize the material cycle society by increasing awareness on the concept of 3Rs (Reduce, Reuse, Recycle). The findings included three guidelines:

- Recycling Guidelines for Waste Generators
- Recycling Guidelines for Dealers of recyclable materials
- Recycling Guidelines for Recyclers

5.2.5.3. Asian Development Bank (ADB)[66]

ADB envisions Asia and the Pacific free of poverty. It is an international development finance institution whose mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Established in 1966 and with headquarters in Manila, ADB is owned and financed by its 67 members, 48 of which are from the region and 19 are from other parts of the globe. ADB's main partners are governments, the private sector, NGOs, development agencies, CBOs, and foundations.

Under Strategy 2020, a long-term strategic framework adopted in 2008, ADB will follow three complementary strategic agenda: inclusive growth, environmentally sustainable growth, and regional integration.

In pursuing its vision, ADB's main instruments comprise loans, technical assistance, grants, advice, and knowledge. Although ADB lends primarily to the public sector, and to governments, ADB also provides direct assistance to private enterprises of developing countries through equity investments, guarantees, and loans.

ADB has over 2,000 staff from around 50 member countries. Over half are Filipino, since the headquarters are based in Manila, but ADB's culture is international. Although by tradition, ADB's president is Japanese, the charter states that the president must be from a regional member country.

[66] "ADB", 24 April 2009, ‹http://www.adb.org/About/default.asp›

Financial Resources

Carrying a Triple-A credit rating, ADB raises funds through bond issues on the world's capital markets. It also utilizes its members' contributions and retained earnings from lending operations. These sources comprise ADB's ordinary capital resources and account for 74.1% of lending to ADB's developing member countries. Loans are also provided from Special Funds Resources - financed mostly from contributions of donor members for ADB's concessional loan and technical assistance programs.

ADB's assistance is financed through the following schemes:

- **Ordinary Capital Resources -** a pool of funds available for ADB's lending operations, replenished by borrowings from the world's capital markets. OCR loans are offered at near-market terms to better-off borrowing countries.
- **Asian Development Fund -** Funded by ADB's donor member countries, ADF offers loans at very low interest rates and grants that help reduce poverty in ADB's poorest borrowing countries.
- **Technical assistance -** Assists countries in identifying and designing projects, improving institutions, formulating development strategies, or fostering regional cooperation. TA can be financed by grants, or, more rarely, loans through ADB's central budget or a number of special funds provided by ADB's donor members.
- **Innovation and Efficiency Initiative** - Financing Instruments and Modalities was introduced in 2005 under IEI. These new financing instruments are intended to provide ADB clients and operational teams with additional alternatives to help finance development projects.

In Cebu City, ADB supports the P24 million study on the utilities and infrastructure necessary at the South Road Properties (SRP), including public transport, water and power supply. Cebu City's Priority Infrastructure Investment Plan (PIIP) will be discussed during the "visioning and scoping" workshop.[67]

John-Olof Vinterhav, team leader of the PIIP of the Cities Development Initiative for Asia (CDIA) Program, said the workshop will allow the City Government officials and the consultants to discuss what they expect of the study.

The study, which will be conducted through a $500,000 grant from the ADB, will cover pre-feasibility studies on the proposed Bus Rapid Transit (BRT), wastewater treatment facility, solid waste management and other utilities at the SRP. Experts in public transport, wastewater treatment, solid waste management, district cooling, water and power supply and legal experts will be conducting the study. The studies will be done in two phases and will take one year to complete. Vinterhav said the Inayawan Sanitary Landfill will also be included in their studies, but he could not say yet how it will be included and what exactly will be studied.[68]

[67] Sunstar Publications, "Financing SRP", 1 May 2009, ‹http://www.sunstar.com.ph/cebu/15-adb-consultants-begin-srp-infra-utilities-study-today›
[68] Ibid.

ABD is also investing for a three-phase project to upgrade the Inayawan Landfill. Phase 1 focuses on upgrade; Phase 2, waste to energy utilizing anaerobic reactor and fertilizer plant and 1MW biogas powerplant; and Phase 3- Trigeneration which features an additional 6MW Power Plant, steam for desalination and heat for cooling.[69]

5.2.5.4. Kitakyushu Initiative for a Clean Environment

Kitakyushu Initiative is an imperative mechanism that seeks to promote urban environmental actions at the local level targeting the control of air and water pollution, minimization of all kinds of wastes, taking selected technical, institutional, regulatory and participatory measures. It attempts to draw lessons from the practices and experiences of Kitakyushu City and other cities and put them together in a menu of effective action that could be of great use for other cities in Asia Pacific region.

Through the Asian Partnership Programme towards Shared Prosperity (ASPRO), the City of Kitakyushu, in cooperation with some Japanese cities such as Ube City and Minamata City, partnered with Cebu City since October 2002. In general, the project aims to achieve environmental conservation and sustainable development in the Asian Region by inter-city environmental partnerships, and to establish appropriate governance and new multi-stakeholders participatory scheme in cooperation with international communities.

One of the results of this project is the establishment of the Metro Cebu Environmental Council (MCEC). MCEC consists of multi-stakeholders such as community representatives, NGOs, representatives of the local government, university, industry, mass media, and the national government (regional office) representatives. The City of Kitakyushu will continue to cooperate with MCEC. The realization of sustainable development and environmental improvement in Cebu City are reflected in the following partnership targets:

2002: Launch of model projects in Cebu
2003: Mid-term review at international conferences
2004: Completion of model projects
2005: Dissemination of final report at international conferences and establishment of new strategies
2010: with five years evaluation and the subject to be considered after 2010

The program aims for the steady improvement of urban environment in the Asian Region, achieve better local society and local-based sustainable development; strengthen local governance capabilities; and contribute to the realization of global

[69] Beltran, R. "Sustainable Investments in Waste Management Infrastructure", Efficient Land Use for sustainable Cities, Asian Clean Energy Forum, 18 June 2009, 10 August 2009 ‹http://www.abd.org/documents/events/2009/CCEWeek/Presentation-Ricky-Beltran-Waste.pdf›

sustainable development through the promotion of local-to-local cooperation model to the Asian Region. [70]

Kitakyushu also supported the Barangay Guadalupe Sewage Treatment Plant Project through technical dispatch.[71]

Fund Sources
Activities are fully based upon partnership initiative and local governments in Japan, Philippines, and Indonesia are involved. These activities are also supported by donor agencies such as JICA and Japan Bank for International Cooperation (JBIC) as described in our Partnership Initiative.[72]

5.2.5.5. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)[73]

GTZ is an international cooperation enterprise for sustainable development with worldwide operations, supporting the German Government in achieving its development-policy objectives. It provides viable solutions for political, economic, ecological and social development in a globalised world. It aims to improve people's living conditions on a sustainable basis.

GTZ is a federal enterprise founded in 1975. The German Federal Ministry for Economic Cooperation and Development (BMZ) is its major client. The company also operates on behalf of other German ministries, the governments of other countries and international clients, such as the European Commission, the United Nations and the World Bank, as well as on behalf of private enterprises. GTZ works on a public-benefit basis. All surpluses generated are channelled back into its own international cooperation projects for sustainable development.

GTZ employs some 13,000 staff in more than 130 countries of Africa, Asia, Latin America, the Eastern European countries in transition and the New Independent States (NIS). Around 10,000 of the staff are German personnel. GTZ maintains offices in 87 countries. Some 1,700 people are employed at Head Office in Eschborn alone.

Partnerships and alliances
To bundle know-how for optimal results in its work, GTZ cooperates closely with other organisations involved in development policy. These include the German Development Service (DED), Capacity Building International, Germany (InWEnt), German Finance Company for Investments in Developing Countries (DEG) and, above all, the KfW German Development Bank. The latter is responsible under commissions

[70] "Asian Partnership Programme towards Shared Prosperity" 2 May 2009, ‹http://webapps01.un.org/dsd/partnerships/public/partnerships/112.html›
[71] "Community based Sewage Treatment Plant Facility, 22 May 2009 ‹http://kitakyushu.iges.or.jp/docs/network_meetings/kin4/ppt/16.Villarete.pdf›
[72] "Kitakyushu, An International City", 24 June 2009, ‹http://www.city.kitakyushu.jp/pcp_portal/PortalServlet?DISPLAY_ID=DIRECT&NEXT_DISPLAY_ID=U000004&CONTENTS_ID=14925›
[73] "GTZ Corporate Profile", 22 June 2009, ‹ http://www.gtz.de/en/unternehmen/1698.htm ›

from the BMZ for financial cooperation with partner countries. With other interface organisations like the KfW, DED and InWEnt, GTZ has numerous shared offices, in Egypt, Vietnam, Manila, India, Jordan, Guatemala and countries in southern Africa. They facilitate local coordination of technical and financial cooperation and relations with joint partners.

In addition, GTZ cooperates successfully with political foundations, churches and numerous NGOs at national and international level, including German Agro Action, the largest German NGO, and the World Conservation Union (IUCN).
Cooperation with the private sector is becoming increasingly important. Since 1999, GTZ, working on behalf of BMZ and together with private partners, has already implemented more than 775 public-private partnerships (PPPs) in more than 90 countries, primarily in Africa, Asia and Latin America.

With a total turnover of 1,224.0 million euro in 2008, some 985.0 million euro came from projects and programmes for public clients, such as the BMZ and other Federal Ministries. Some 80.5 percent of GTZ turnover is under contracts from the German Federal Government. GTZ made 19.5 % (239.0 million euro) in 2008 from contracts from other clients and financing institutions, mostly international, and from private sector companies.[74]

5.2.5.6. USAID-Environmental Governance Project (EcoGov)[75]

In 2006 the Province of Cebu entered into a partnership with the DENR and the EcoGov Project to help municipalities and cities in the province improve the governance of their forests and forestlands, coastal resources and solid waste and wastewater management. This involves the delivery of technical assistance and support services to these LGUs, and the strengthening of the Provincial Environmental and Natural Resources Office (PENRO) to be able to more effectively provide these services.

With technical assistance from EcoGov, the PENRO facilitated the clustering of coastal municipalities based on an ecosystem approach. The Camotes Sea Inter-LGU Council is one such cluster, with the members pooling efforts and resources to effectively manage their coastal and marine resources. Similarly, 13 LGUs in northern Metro Cebu formed a cluster to develop an integrated solid waste facility in Danao City.

The provincial government is backing up its environment-related efforts with funding support. The FY 2006 AIP includes P15M for solid waste management, in addition to a P10M continuing appropriation from 2005. The outlay includes funds for the purchase of waste disposal equipment and facilities.

[74] Ibid.
[75] "EcoGov and DENR establishes full partnership with Cebu Province", 3 June 2009, ‹http://ecogovproject.denr.gov.ph/docs/Story_EcoGov_DENR_establish_partnershp.htm›

5.2.4. Summary

The brief profiles of various institutions that have a direct stake at Cebu City's solid and plastic waste management are summarized in Table 6. In Table 7, their direct engagement is identified, as well as the gaps in participation of the different sectors involved.

International organizations engage in more strategic programs that covers general or specific areas in solid waste management. For instance, ABD's three phase project to for an integrated solid waste management in Inayawan; GTZ's support for SRP facilities, including solid waste and wastewater management; Kitakyushu Initiative's eight-year development in the city's solid waste management systems; USAID's national support for Recycling Market, whose Eco-governance project also has Cebu City in its list of beneficiary LGUs.

It can also be observed that the NSWMC is facing challenges in overseeing the implementation and enforcement of RA 9003. This could be attributed to its lack of human and financial resources, on the one hand, and the unrealistic time-bound targets set in the law where LGUs could hardly cope to comply, and the NSWMC could barely monitor 80 provinces and 120 chartered cities of the country.

The NGO sector's complementary role to help educate stakeholders on SWM is not enough. The sector should take a more vigorous engagement as environmental watchdogs in enforcing the law since more often than not, government institutions fail in compliance measures.

LGUs seems to have set their eyes on disposal concerns, and less so for diversion, recovery, reuse and recycling. Favorably, NGOs and corporate organizations have taken more proactive measures.

Table 6. Institutional Profiles

ROLE AND MANDATE	INSTITUTIONAL FRAMEWORK	HUMAN RESOURCES	SOURCES OF FUNDING
Department of Environment and Natural Resources			
Primary agency responsible for the conservation, management, development and proper use of the country's environment and natural resources.	Assure availability and sustainability of the country's natural resources	Headed by the Department Secretary, assisted by several Under Secretaries and Assistant Secretaries, with bureaus and attached agencies.	Annual appropriation, loans, grants, funding from corporate partners for specific projects. Direct revenue from fees and fines.
National Solid Waste Management Commission			
The agency tasked to implement the Ecological Solid Waste Management Act-RA 9003 Oversee the effective implementation of SWM plans by LGUS	Assessment of SWM situation, analysis of options, mandatory program of action, public participation and information campaign, standardization and measurement of performance on RA 9003	Inter-agency and muli-sectoral members (17) of the Commission, has a Secretariat and a National Ecology Center to provide consultancy and technical assistance on SWM	National SWM Fund from RA 9003, thereafter part of the annual appropriation DENR. Additional funding from international and corporate partners.
Department of Interior and Local Government			
DILG's mandate is empowering LGUs to deliver effective and efficient public service. Its mission is to promote peace and order, ensure public safety and strengthen capability of local government units.	designated to 'assist the President in the exercise of general supervision over local governments; advise the President in the promulgation of policies, rules, regulations and other issuances on the general supervision over local governments and on public order and safety;	Headed by the Department Secretary, assisted by several Under Secretaries and Assistant Secretaries, with bureaus and attached agencies.	Annual appropriation, loans, grants, funding from corporate partners for specific projects. Direct revenue from fees and fines. According to the IRR of RA 7160, the budget of the DILG is from the General Appropriations Act (Sec 107). For 2009, the DILG Budget is at P62 billion
City Government			
A general purpose government for the coordination and delivery of basic, regular, and direct services and effective governance of the inhabitants within its territorial jurisdiction			Annual Internal Revenue Allotment Tax and non-tax revenue
City Solid Waste Management Board			
Prepare, submit, and implement a plan or the safe and sanitary management of solid waste generated in areas under its jurisdiction		Inter-agency and Multi-sectoral Board headed by the City Mayor	Budget from the city government, grants and donations from corporate and other funding institutions
Department of Public Services			
Created to effectively address the city's worsening problems on solid waste management, street cleaning and lighting and maintenance of garbage trucks	Make Cebu the cleanest and greenest city in the south through the implementation of a sound clean and green program	Headed by the DPS Department Head, Engr. Gualiza	One million for its creation, operation and maintenance

Table 7. Continuation (p2)

ROLE AND MANDATE	INSTITUTIONAL FRAMEWORK	HUMAN RESOURCES	SOURCES OF FUNDING
Cebu Environmental Sanitation Enforcement Team			
The city's main arm for enforcing national and local solid waste management laws			Direct income from fines and settlement fees
Barangay			
A general purpose government for the coordination and delivery of basic, regular, and direct services and effective governance of the inhabitants within its territorial jurisdiction		Headed by Barangay Captain, has a Brgy Council with different committees	Annual Internal Revenue Allotment Tax and non-tax revenue
Barangay Solid Waste Management Committee			
Prepare, submit, and implement a plan or the safe and sanitary management of solid waste generated in areas under its jurisdiction		Inter-agency and Multi-sectoral Committee headed by the Barangay Chairman	Budget as set by the Barangay Council, grants and donations from corporate and other funding institutions
Kaabag sa Sugbu			
A unified and organized coalition to assist in the development of the city		Board composed of representatives of member organizations, Secretariat composed of four people headed by Executive Director Jacque dela Pena	Misereor, funds pooled by member organizations, grants from local and international funding agencies
Philippine Business for Social Progress			
Committed to the empowerment of the poor by promoting business sector leadership in, and commitment to poverty reduction programs	Helping people help themselves	Board from member companies, has regional offices----------	Membership dues, special donations and project specific funding from member organizations, grants from international funding institutions.
Gagmay'ng Kristohanong Katilingban Lihok-Pagtinabangay Multi-Purpose Cooperative			
A non-stock, non-profit cooperative foundation for Inayawan waste pickers	Building communities to uplifting the quality of life of the poor through the organization, support, and capability of scavengers at the Inayawan landfill	About 300 members, headed by Lilia R. LLanto, Chairwoman.	Capital build-up from cooperative members, membership dues and income from the cooperative's business activities
Cebu Business Park and Neighboring Barangays Altruistic Alliance			
Address social concerns by generating employment and livelihood opportunities through waste segregation and collection	Building a larger community of people with varied resources, yet common collective goals and aspirations	Representatives from Cebu holdings and partner barangays, 15 staff for collection and segregation, women for developing products from waste materials	Cebu Holdings, other establishments in Cebu Business Park, direct income from selling collected recyclables

Table 6. Continuation (p3)

ROLE AND MANDATE	INSTITUTIONAL FRAMEWORK	HUMAN RESOURCES	SOURCES OF FUNDING
Lihok Pilipina Foundation			
Empowering women through various programs and projects	Working for the acceptance of the significance of women's perspective in national development	Original 20 members, women members from partner barangays	Financial assistance from Cebu City, Cebu-PCEEM, direct income from selling of recyclables, income from cooperative
Mantech Management Services			
Private enterprise engaging in the business of hauling waste	Committed to a foundation of operating excellence and professionalism, pursues projects, initiatives and commitment to the preservation of the environment	General Manager is Tootsie Yang	Private capital, direct income from hauling contracts
Plasironcan Trading			
Private company engaged in trading recyclables			Private capital, direct income from buying and selling recyclables
Cebu Ace Trucking Corporation			
Private transporter and heavy equipment provider			Private capital, direct income from contracts
Canadian International Development Agency			
Canada's lead agency for development assistance. Its mandate is to support sustainable development in developing countries to reduce poverty and contribute to a more secure, equitable and prosperous world.	Commitment as part of the global community is also the basis for working in partnership to address the MDGs.		Canadian government, CIDA International aid envelope ($3.7 billion) 78% from CIDA 10% Dept of Finance 8% Dept of Foreign Affairs and International Trade Canada 4% International Devt. Research Center
Japan International Cooperation Agency			
One stop shop of Japan's ODA, Provide technical assistance, loans and aid		1664 staff with Mrs Ogata as head, with thousands of experts and volunteers	Japanese Government
Asian Development Bank			
International development finance institution, mission to developing member countries to reduce poverty	Inclusive growth, environmentally sustainable growth and regional integration	Over 2,000 staff in 50 countries	Owned and financed by member countries, retained earnings from lending
Kitakyushu Initiative			
To promote urban environmental actions at the local level targeting the control of air and water pollution, minimization of all kinds of wastes, taking selected technical, institutional, regulatory and participatory measures.	Capacitate local governments in Asia and the Pacific through the promotion and application of integrated win-win approaches in urban environmental management and the promotion of socio-economic livelihood at the local level.		Kitakyushu City, ESCAP, ASPRO and other funding partners

Table 6. Continuation (p4)

ROLE AND MANDATE	INSTITUTIONAL FRAMEWORK	HUMAN RESOURCES	SOURCES OF FUNDING
Deutsche Gesellschaft für Technische Zusammenarbeit			
International cooperation enterprise for sustainable development with worldwide operations	Provides viable, forward-looking solutions for political, economic, ecological and social development in a globalized world	13,000 staff in more than 130 countries	German government, with German Ministry for Economic Cooperation and Devt, private partners
United States Assistance for International Development- EcoGov Project			
The principal U.S. agency to extend assistance to countries recovering from disaster, trying to escape poverty, and engaging in democratic reforms.			United States Government

Table 6. Institutions involved in the SWM Chain, Cebu City

	PUBLIC INSTITUTIONS		PRIVATE INSTITUTIONS		INTERNATIONAL ORGANIZATIONS
	NGAs	LGU	NGOs	ENTERPRISES	
Overall General	DENR-NSWMC DILG	City Council City SWMB DPS/CESET CPDO Barangay Council, BSWMC Brgy. Tanod/Eco-Aide Units	Kaabag sa Sugbu PBSP CBPNBAAI Lihok Filipina GKKLPMPC	Individual private establishments Private service providers such as collectors, transporters, and treaters recyclers	UNEP , GTZ Kitakyushu City JICA ADB USAid Eco-gov CIDA
Source Reduction	NSWMC	CSWMB, CPDO, DPS, BSWMC Efforts mainly on public information activities.	More efforts should focus on NGOs role in educating waste generators for source reduction	Individual private establishments Corporate organizations	
Segregation of Waste (at source)	NSWMC	DPS, CESET BSWMC Brgy. Tanods/Eco-Aides -more LGU focus needed in ensuring segregation at source.	CBPNBAAI Lihok Filipina	Individual private establishments Janitorial Contractors	
Primary Storage and collection	NSWMC	DPS, CESET BSWMC Brgy. Tanods/Eco-Aide Units	CBPNBAAI Lihok Filipina	Individual private establishments Janitorial Contractors Private haulers	
Transportation and Transfer Stations	NSWMC	DPS BSWMC Local LGU partners of private institutions	CBPNBAAI Lihok Filipina	Individual private establishments Janitorial Contractors Private haulers/transporters	
Treatment	Weak monitoring and enforcement by NSWMC	DPS-Landfill Management - no capture, treatment and conversion of leachate	Environmental watchdog groups needed to monitor non-environment-friendly practices, technology and systems in SWM	Ex. Bethseda Bio'Solutions, etc.	-support from international funders to install treatment system for landfill leachate, or capture leachate for biogas conversion
Reuse and Recycling	Weak presence of NSWMC in reuse and recovery measures	No programmatic approach in reuse and recycling that should be led by CSWMB and/or BSWMC	Kaabag sa Sugbu PBSP CBPNBAAI Lihok Filipina	Informal sector Plasironcan Other private buyers/sellers	Major partner needed for institutionalizing/ mainstreaming reuse and recycling
Resource Recovery	Weak presence of NSWMC in resource recovery measures	No programmatic approach in waste recovery that should be led by CSWMB and/or BSWMC	Kaabag sa Sugbu PBSP CBPNBAAI	Informal Sector Waste Pickers Coop	Major partner needed for institutionalizing/ mainstreaming waste recovery

5.3. Financing Mechanisms

With the rapid growth of waste generation rates, more investments are now required to bring improvements in the SWM chain. Favorably for governments, the charge of financing solid waste management systems has been taken up by other stakeholders as well, including local governments, NGOs and international donors. There are also more ways of gaining returns from different levels of waste management. Some of the widely practiced economic instruments include user charges, penalties, fines and levies, environmental bonds, environmental funds, direct loans, international cooperation, national subsidies, annual budgets, and private sector participation (PSP).

5.3.1. Appropriations

From the National Budget, the concerned agencies such as the DILG and the DENR, receive annual appropriations subject to change year per year based on national priorities. They in turn prepare their own budget. As solid waste management is not the primary mandate of the DILG, it only shares a small percentage of its budget as needed for specific cooperation projects with the League of Provinces, League of Cities and League of Municipalities in the Philippines.

The DENR, on the other hand, gives a very small percentage to the NSWMC as it is only one of the Department's numerous programs. Table 8 shows the percentage given to the NSWMC from the DENR budget from 2003 to 2006.

Table 8. DENR Expenditure Budget for FY 2003-2006 (Million Pesos)

FISCAL YEAR	2004	2005	2006 PROPOSED
DENR	4,482	4,557	6,300
EMB	278 (100)	287 (100)	316 (100)
Personnel	138 (49.6)	124 (43.3)	158 (50.0)
M & O	140 (50.4)	132 (46.2)	145 (45.9)
Capital Outlays	-	30 (10.5)	13 (4.1)
(NSWMC/ Secretariat) (1)	6.3 (2.3)	4.0 (1.4)	7.8 (2.4)
(Regional Allocations) (2)	6.1 (2.2)	5.0 (1.7)	7.3 (2.3)

(1) Does not include Personnel of the Secretariat Office
(2) 40% of the SWM related M & O budget of EMB is allocated to the Regions.
Source: N. Yamamura "Institutional and Financial Performance Evaluation on SWM in the Philippines", JICA Philippines, Nov. 2005.

5.3.2. Taxes and other incentives

Chapter IV of RA 9003 provides incentives for SWM projects and programs:

1. **Fiscal incentives**
   a. Tax and duty exemption on imported capital equipment and vehicles until January 2010, LGUs, enterprises or private entities shall enjoy tax and duty-free

importation of machinery, equipment, vehicles and spare parts used for collection of solid wastes. Conditions to this exemption applies to equipment and vehicles not manufactured locally in sufficient quality, are needed for SWM purposes only and DTI-BOI approved. The same exemption applies to domestic capital equipment at 50% tax credit equivalent.

b. Tax and duty exemption of donations, legacies and gift to LGUs, enterprises or private entities, including NGOs, for the support and maintenance of the program for effective solid wastes management shall be exempt from all internal revenue taxes and customs duties, and shall be deductible in full from the gross income of the donor for income tax purposes.

2. Non-Fiscal Incentives provided to businesses and industries engaged in the recycling and are registered with the NSWMC and have been issued ECCs in accordance with established guidelines. This includes simplified procedures for the importation of equipment, spare parts, new materials, and supplies, and for the export of processed products.
3. Financial Assistance Program from government financial institutions such as the Development Bank of the Philippines (DBP), Landbank of the Philippines (LBP), Government Service Insurance System (GSIS), and other government institutions providing financial services gives high priority to extend financial services to individuals, enterprises, or private entities engaged in solid waste management.
4. LGUs whose SWM plans have been duly approved by NWSC or who have been commended for adopting innovative SWM programs may receive grants to develop their technical capacities.
5. Incentives to LGUs who host common waste management facilities shall be entitled to incentives.

Under **The BOT Law** (RA 6957 as amended by RA 7718) up to 40% foreign equity is allowed in a project proponent and facility operator of a BOT Project requiring a public utilities franchise. Projects involving the generation or transmission, but not distribution, of electricity may be 100% foreign-owned.

Under the BOT Law, project proponents are eligible for fiscal incentives as provided under the Omnibus Investments Code. Local government units may also provide for additional tax incentives, exemptions or relief. The Government may also provide any form of direct or indirect support or contribution, such as, but not limited to, cost sharing, credit enhancements, direct government subsidy, or government equity.[76]

Incentives for hosting city landfill[77]

Since the Inayawan Landfill has already exceeded its capacity, Cebu City Mayor Tomas Osmena started seeking a barangay in the city that would be willing to host the new landfill. Mayor Osmena offered Php 5 million or more incentives to barangays. However,

[76] "The Philippine BOT Law", 25 June 2009, ‹http://www.neda.gov.ph/references/RAs/RAs%207718%20or%20the%20BOT%20Law.pdf›
[77] "P5M benefits for landfill host barangay",1 June 2001, ‹http://www.philstar.com/Article.aspx?articleid=401402›

there were no takers to this offer since barangay officials are afraid the presence of a landfill in their barangay would turn off potential investors.

5.3.3. Support

To help developed countries comply with prescribed global greenhouse gas (GHG) emission reduction goals as provided by the Kyoto Protocol, The Clean Development Mechanism (CDM) was established. With CDM, developed countries will be able to comply with 2012 emission targets through projects implemented in developing nations. CDM projects may range from developing clean energy sources to spearheading waste management initiatives, as well as agricultural and afforestation/reforestation-related activities.

For Clean Development Mechanism (CDM), DENR issued DAO No. 2005-17 or the Rules and Regulations Governing the Implementation of EO 320 Series of 2004, Designating the DENR as the National Authority for CDM. With DAO No. 2005-17, the Philippines can now formally host CDM projects, which are expected to improve the country's capability to bring about sustainable development. Waste to energy projects are included in the CDM projects that can be implemented with funding from multi-national corporations needing to carbon credits.[78]

Support for the Inayawan Landfill[79]

Even the City Calamity Fund can be accessed for solid waste concerns whenever appropriate. For almost two weeks starting April 6, four hectares of the dumpsite portion of the landfill was on fire. To carry out response operation, the Cebu City Disaster Coordinating Council (CDCC) approved P5.98 million from the calamity funds for the acquisition of various items and resources.

The funds allocates around Php 1.8 million for renting various heavy equipment, Php 1.6 million for the purchase of assorted hardware supplies and the rest for medical supplies, food packs, communication and firefighting equipments.

5.3.4. Subsidies

Support for SWM programs comes from various sources. In a recent visit of Pres. Gloria Arroyo to the City, she turned over a check worth Php 100 million to Cebu Governor Gwendolyn Garcia to be given to be given to all cities and municipalities for the implementation of their solid waste management program. Each LGU will receive not less

[78] Philippine Environmental Updates By: Jocelyn J. Gregorio-Reyes Quisumbing Torres Manila, Philippines June 2006 ‹http://www.bakernet.com/NR/rdonlyres/242DB930-BD3F-4421-A9F9-C46E6FABEA3E/0/2006_IEC_Philippines_Country_Paper.pdf›
[79] "Council approves P6 million for landfill" The Freeman, 3 July 2009 ‹http://www.philstar.com/Article.aspx?articleid=461034 Council approves P6 million for landfill (The Freeman)›

than P1 million as the province will provide counterpart funding and will be released by the last quarter of 2009.[80]

5.3.5. Privatization

More and more public utilities are being privatized to spare LGUs from capital and maintenance costs. The Inayawan has been up for privatization for a couple of years. Bidding has been completed and failed a couple of times.

According to the terms, the winning bidder will own the property but will still submit revenues to the city government as part of the agreed conditions. Privatization of the sanitary landfill will save the city government the Php 7 million it spends annually for managing the dumpsite.[81]

5.3.6. Fees

Environmental Compliance Certificate (ECC) Fees[82]
Upon submission of the application for ECC, the company applicant shall pay filing and other fees in accordance with prescribed standard cost and fees. The applicant is also mandated to set aside the Environmental Guarantee Fund (EMF), a Mandatory Environmental Insurance Coverage (DAO 2005-06). The Multipartite Monitoring Team (MMT) will also be given budget through the EMF. For Penalty of suspension or cancellation of ECC and/or fine of not more than P50,000.00 per violation shall also be charged to the company.

Garbage Fees for depositing garbage or refuse in the city's disposal area, whenever deposit is made not by the authorized collector, the following garbage fees:

P300.00 per truck of 1/2 ton, per delivery
P500.00 per truck of over 1/2 ton, per delivery;

Disposal fee For bulky refuse or solid waste that are not to be considered as ordinary garbage, and disposal fee shall be imposed, thus:

For one (1) ton or less of such garbage - P150.00 basic fee
Over one (1) ton, an additional of P100.00 per ton or a fraction thereof [83]

[80] "Funding for solid waste program set for release", The Freeman, 12 June 2009, ‹http://www.philstar.com/Article.aspx?articleid=453399›
[81] "Bidding for landfill management reset", The Freeman" 15 July 2009 ‹http://www.philstar.com/Article.aspx?articleid=435157›
[82] "EMB-Laws and Policies of Hazardous Waste Management" 18 June 2009, ‹ http://www.emb.gov.ph/laws-hw.htm›
[83] Cebu City, "Ordinance No.1361", 3 May 2009, ‹http://www.globenet.org/preceup/pages/ang/chapitre/capitali/cas/phimana_e.htm›

5.3.7. Fines

CESET Citation Ticket[84]

CESET Citation Ticket for violation of the provisions in RA 9003, City Ordinance No. 1361: and City Ordinance No. 2031. Fines or settlement fees start from Php 500.00 to Php 5,000.00. The fine is divided to three: 20% goes to the one who apprehended the violator, 50% to the city funds and 30% will be used as incentives SWM projects.

Clean Air Act (CAA) of 1999[85]

- **A** fine of < P 100,000.00 for everyday of violation of standards until such time that
- standards have been complied with o
- For violations of all other provisions a fine of not less than P 10,000 but nor more than P100, 000 or six months to six years or both. If the offender is a juridical
- person, the president, manager, directors, trustees, the pollution control officer of the officials directly in charge of the operations suffer the penalty.
- Fine for Open Burning - the penalty ranges from P300.00 to P1,000,000.00 and/or imprisonment of 1 day to 6 years for violation of this provision.

5.3.8. Private-initiated Projects

Some projects and services are initiated by private companies and NGOs. These include the "Trash for Cash" project of SM and Philippine Business for the Environment (PBE) where a regular schedule of buying recyclables is conducted at the malls. PBE's Industrial Waste Exchange was initiated by PBE and supported by member companies. It is a matching program for wastes and needs of various establishments. The Hotel and Restaurant Environment Manual was initiated by Hotel and Restaurants Association of the Philippines (HRAP) and supported by The Asia Foundation. The Green Bag Campaign is a plastic waste reduction program of the SM Chain of Malls. Coca-Cola's 'My PET Project' is a PET bottle recovery program being conducted throughout the country.

5.3.9. Private Franchise, Contracts and Open Market Ventures

Service providers enter into contracts with commercial and industrial clients who require their registered and licensed service. Some of these include Mantech, a private hauler; Plasironcan, a waste trader, Cebu Ace Trucking a licensed transporter; for waste water, CCTF joint venture project, and for PASSI for hospital waste. There are a host of other service providers and business holders engaging the waste industry.

[84] Cebu City, CESET Citation Ticket, 2009
[85] "REPUBLIC ACT NO. 8749", 15 May 2009, ‹http://www.chanrobles.com/philippinecleanairact.htm›

5.3.10. Summary

Table 9 lines up the type of service, the organizations involved, as well as the direct incomes, government support and financing assistance from the private sector a SWM service or program receives.

It can be seen that in all three waste streams, residential, commercial and industrial, source reduction is not given attention in terms of projects, programs of funding. The table also shows how heavily subsidized municipal solid waste management by the LGU is, since budget is allotted at almost all phases of solid waste management chain, yet there is only one regular source of direct revenue, tipping fees. Other areas of the SWM chain such as diversion and recovery, as well as reuse and recycling, are mainly informal sector activities that need to be documented and eventually mainstreamed and institutionalized. More investments will be needed as these measures are being mainstreamed.

Currently, there is no major project for waste plastic to resource conversion in Cebu City. Most on waste plastics are limited to cottage industry types of projects that make simple arts and crafts items from waste plastics. Most waste plastics are being traded by junk shops to major buyers[86] who in turn transport these materials to major recycling centers in Mindanao and Valenzuela, Metro Manila.

For commercial wastes, major companies have been self-regulating their solid waste generation and disposal. They have installed their own systems and mitigating projects, using private capital. Some have also provided funding and assistance to CBWM projects.

The CCTF, although a treatment facility for industrial wastewater, presents an excellent illustration of how various financing schemes are pooled together for an environmental project. By offering common shares to electroplating industries and other investors, it was able to come up with Php 3M in private capital, and Php 8M loan was provided by the DBP. GTZ, on the other hand, gave a grant amounting to Php 20M for technical assistance and wastewater treatment equipment. Finally, land was provided by the Cebu City Government in a "joint venture agreement". Not without difficulties, though, the facility was finally set up and currently operating.[87]

Although limited, there is not a lack of economic instruments provided by law, international and corporate funders for the government, the private sector and even communities not to engage in SWM projects. One concern is the lack of fund matching mechanism. Simply put, how a small cooperative of junkshops will know of available support from NGOs and from corporate foundations, or how a 4th class municipality will be aware and be able to apply for CDM projects.

[86] Major plastic buyers refused to be interviewed to be included in the study,
[87] Investments for a Cleaner Environment: Issues, Problems and Prospects Related to the Financing of a Common Treatment Facility for Toxic and Hazardous Wastes from the Electroplating Industry in Metro Cebu, Philippines., Sol Eharle, 2007

Table 9. Financial Mechanisms for Solid Waste Management Chain, Cebu City (1/2)

TYPE OF SERVICE	ORGANIZATION	FINANCING MODE		
		DIRECT REVENUE	OTHER SOURCES	PRIVATE SECTOR PARTICIPATION
Overall SWM	DENR-NSWMC and LGUs	Fees and fines Taxes and levies	Annual Appropriations Internal Revenue Allotment Aids, grants and subsidies	Contracts, franchise, BOT,
Waste Plastics from Residential Sector				
1. Source Reduction				
2. Collection	Cebu City DPS	Collection fee from generators	LGU budget allotment	
	Barangay Waste Collection Unit	Collection fee from generators	LGU budget allotment	
3. Transportation	Cebu City DPS		LGU budget allotment	
	Barangay Waste Collection Unit		LGU budget allotment	
4. Treatment			LGU budget allotment	
5. Disposal	Cebu City DPS, Inayawan landfill Management		LGU budget allotment Funding agencies	Grant
6. Waste Recovery and Recycling	PBE and SM Trash for Cash	Sale from collected recyclables	Private capital	Open Competition (market-based)
	Plasironcan and other private buyers	Trading of waste materials	Private capital	Open Competition (market-based)
Waste Plastics from Commercial Sector				
1. Source Reduction	Ex. EMMRO and HRAP waste minimization program and manual		Support from PBE and The Asia Foundation	Grant
	SM Green Bag and My own Bag (MOB) Campaign	Proceeds from sale of Green Bag	Savings from less plastic bags SM Foundation	Open Competition (market-based)
2. Collection	Private Janitorial Services	Fees from commercial establishments		Contracting
3. Transportation	Man-Tech and other private service providers	Fees from commercial clients		Contracting
	NB Altruistic Association	Proceeds from recyclables from Ayala and Cebu Business Park	Donated collection trucks from CHI	Grant
4. Treatment	City STP for liquid waste Other licensed	Fees from commercial and industrial clients		
5. Disposal	Cebu City DPS, Inayawan landfill Management	Tipping Fees from commercial and industrial waste sources or their private hauling contractors		Contracting
6. Waste Recovery and Recycling	PBE and SM Trash for Cash	Sale from collected recyclables		Open Competition (market-based)
	Plasironcan and other private buyers	Trading of waste materials		Open Competition (market-based)

Table 9. Continuation (2/2)

TYPE OF SERVICE	ORGANIZATION	FINANCING MODE		
		DIRECT REVENUE	OTHER SOURCES	PRIVATE SECTOR PARTICIPATION
Waste Plastics from Industrial Sector				
1. Source Reduction				
2. Collection	Individual industries			
	CATC and other private service providers	Collection fees from industrial clients		Contracting
3. Transportation	Individual industries			
	CATC and other private service providers	Transporting fees from industrial clients		Contracting
4. Treatment	CCTF	Treatment fees from industrial clients,	-PhP 100.00 per common share from private investors now at Php 3M. -Bank the Development Bank of the Philippines loaned Php 8 M for construction of two buildings which house the sludge storage and the water treatment equipment. -German Agency for Technical Cooperation donated Php 20M for technical support and waste water treatment equipment -City of Cebu provided land under a "joint venture agreement".	Private investment Loan Grant Joint venture agreement
5. Disposal	Cebu City DPS-Landfill Management	Tipping Fees		
6. Waste Recovery and Recycling	Coca-cola Bottlers Philippines My PET Project	Proceeds of Collected PET		Open Competition (market-based)
	PBE Industry Waste Exchange network (IWEX)	Proceeds from Waste Exchange	Initial funding came from the US Agency for International Development (US-AID) as part of a grant covering several activities. Since then, participants in the waste exchange and related activities have also been providing some support, in-kind or in-cash through advertisements in the Business and Environment magazine.	Open Competition (market-based)

5.4. Technology

Technologies in managing solid wastes now vary from simple and traditional practices to large-scale and highly sophisticated facilities used for collection, transportation, treatment, disposal, recycling and recovery of wastes. There are different technological interventions within a solid waste management chain and these are documented in each stage of waste management. Technologies might be applied upstream in the waste management chain in terms of source reduction, or downstream from primary collection and transfer, transportation, treatment, final disposal, recycling and recovery.

5.4.1. Primary Disposal by Waste Generators

There is a high efficiency in collection in the especially in urban barangays, but in rural barangays, common disposal practices still involve dumping, burning, burying and feeding to animals. According to the 2000 census, 49.1% burned their wastes. This practice has been lessened because of the enforcement of provisions in RA 9003 and local ordinances.

Table 10. Usual Manner of Garbage Disposal, Metro Cebu: 2000

METHOD OF DISPOSAL	HOUSEHOLDS	
	NUMBER	PERCENT
All Methods	676,401	100.00
Picked up by garbage truck	212,652	31.5
Dumping	71,192	10.5
Burning	331,762	49.1
Composting	16,891	2.5
Burying	16,891	2.5
Feeding to animals	11,929	1.8
Others	4,272	0.6

Source: Cebu, A Demographic and Socio-economic Profile Based on the 2000 Census
JICA, Cebu SEED Project, Office of Population Studies, 2004

5.4.2. Collection, Transfer and Transportation

For municipal solid waste, primarily, technology in collection, transfer and transportation involve only traditional mobile equipment such as garbage bins and pushcarts, *tri-sikad* or three-wheeled bikes, dump truck and compactors.

There is only one transfer station for wastes located at the DPS garbage truck dispatching area about 300 square meters where waste from the Carbon market, collected using pushcarts, are transferred to garbage trucks.

5.4.3. Treatment and Disposal

5.4.3.1. Inayawan Sanitary Landfill

Cebu City started operating a 15 hectare sanitary landfill in Barangay Inayawan in September 1998. In 2001, it was the only active sanitary landfill in the country. It receives 400 tons daily and was designed to have a life of 6-7 years. It is still operating serving all 80 barangays.

The landfill was built based on the semi-aerobic design. Landfill gas is vented through a series of horizontal and vertical pipes. However, the leachate treatment pond serves only as an impounding basin, which discharges partially treated leachate to the surrounding area, causing the adjacent communities to complain.

Technical problems have closed down its materials recovery facility due to mismatch of equipment between collection vehicles and the recycling facility. This condition constrained recycling efforts and increased the daily volume of waste disposed in the landfill. A large scale incinerator built was not used when the Clean Air Act was enacted. This and other technical difficulties are being faced by the City government and the Landfill Management.[88]

Also located inside the Inayawan landfill compound is the PhilBio biogas reactor for the sewage and leachate. Due to technical difficulties, the reactor project has been shelved.

In September 2008, Legazpi, reported that with 350 to 400 tons of garbage being collected by the city daily, the landfill in Inayawan now has more than one million tons of trash. That the maximum height of the pile of garbage is supposed to be only six meters and now it has reached eight meters. Although the landfill's lifespan was supposed to be only seven years, the city government has been using a compactor machine for the leveling and pushing the garbage at the landfill.[89]

5.4.3.2. Bethesda Bio'Solutions[90]

Bio'Solutions technology is a liquid culture of natural and beneficial aerobic and anaerobic microorganisms. It consists of photosynthetic bacteria, lactic acid bacteria and yeast. The use of Bio'Solutions will eliminate the stench emanating from the open dumpsite area and covert the segregated organic waste into a revenue-generating compost.

[88] World Bank, Philippine Environment Monitor 2001 Solid Waste, 2001.
[89] "Inayawan landfill already full: Cebu City needs a new dumpsite" By Mitchelle L. Palaubsanon, (The Freeman), 31July 2009, ‹http://www.philstar.com/Article.aspx?articleid=399143›
[90] "Firm to solve city's woes on landfill", (The Freeman) July 1, 2009 ‹http://www.philstar.com/Article.aspx?articleid=417034›

The technology does not contain any genetically engineered or modified organisms, not chemically synthesized, safe and easy to handle, and is harmless to human health even if accidentally ingested.

5.4.3.3. Community-based Sewage Treatment Plant Facility[91]

The Community-based Sewage Treatment Facility is located by the Guadalupe River at Brgy. Sambag I, Cebu City. The project's objective to restore the vitality of the Guadalupe River through improvement of the river water quality.

The Cebu City Government has spent almost Php 1 million. UNESCAP donated $9,000.00 for the project while the City of Kitakyushu and Japan International Cooperation Agency (JICA) extended assistance through technical expert dispatch.

After completion of the treatment tank, the top of the facility also served as gathering area for the residents to hold meetings or games. The sewage treatment plant is partially operational while households are being connected to the tank. Currently, the city government is processing the purchase of equipment such as DO meter, pH meter, among others, to test efficiency of the STP.

The technology model is being planned to be adoption in other areas along the Guadalupe and other river systems. The city government also plans to expand application in domestic waste water treatment for the city's communities. The design while also be modified and simplified from the prototype to reduce costs of civil works.

5.4.4. Reuse, Recycling and Recovery

Each barangay or cluster of barangays are required to have their own Materials Recovery Facility according RA 9003. However as of the 4th Quarter of 2007, only ten percent of the Cebu City's 80 barangays have their MRF based on NSWMC listing[92]:

- Ayala Center
- Brgy. Calamba
- Brgy. Hipodromo
- Brgy. Inayawan
- Brgy. Labangon
- Brgy. Luz
- Reclamation Area-Cebu City Nursery
- Sto. Nino Village

[91] "Community based Sewage Treatment Plant Facility", 16 June 2009, ‹http://kitakyushu.iges.or.jp/docs/network_meetings/kin4/ppt/16.Villarete.pdf›
[92] National Solid Waste Management Commission, Office of the Secretariat, List of Material Recovery Facilities, June 8, 2009 ‹ ------ ›

A cluster of barangays involved in CBPNBAAI are enagaged in various recycling and recovery projects. For recovery, the organization gets the segregated recyclables from the Cebu Business Park establishments.
The informal sector also has various ways of gathering recyclables, especially wastes plastic. Individual buyers go around either buying or asking for recyclables from households or establishments. Others pick recyclables on the streets or from waste bins outside houses or establishments.

These waste buyers and waste pickers use *tri-sikad* and sell the collected recyclables to an undetermined number of small junk shops.

Figure 4. Informal Waste Recovery in Cebu City

This old woman picks wastes on early mornings.


Tri-sikad used for collected wastes, mostly plastic.


Children picking waste at Inayawan.


Bakat and sack at the side of truck for recyclables.

5.4.5. Summary Data Sheet

Existing technologies for municipal solid waste management system in Cebu City are summarized in Table 11.
Currently in Cebu City, technology for converting waste plastics and other recyclables to resource are limited to making of arts, crafts and minor products. As of yet, there is no existing waste to energy technology being used in the city, as well as no manufacturing companies converting wastes into other materials on industrial or small scale. One alternative technology that could be used is the Hydromex Technology which allows capture of non-biodegradable waste into lightweight building products and concrete.

With the passage of the Renewable Energy Act and the current international developments on the extension of the Kyoto Protocol after 2012, more and more waste to energy technologies will be mainstreamed in the country. However, selection of technology should be localized in terms of scale of use, contextualized based on local situation and customized based on local need.[93]

[93] UNEP, GEC, Converting Waste Plastics into a Resource, International Expert Group Workshop, International Experts Workgroup, June 15, 2009, 5 August 2009, ‹http://gec.jp/jec/en/activities/EST/2009/wasteplastics/summary_day1-wasteplastics.pdf.›

Table 11. Technology for Municipal Solid Waste Management, Cebu City (1/2)

TYPE OF SERVICE	TECHNOLOGY		
	TYPE	NUMBER	IMPORTANT FEATURES
Waste Plastics from Residential and Commercial Sector			
1. Source Reduction			
2. Collection and Transportation[94]	-Six wheeler Dump Trucks	Twenty (20) trucks	Collect garbage within the barangays of Metro Cebu and specific locations or main thoroughfares. They also have two garbage trucks during daytime or night time for the taskforce collection. Task force collection is a collection to the main thoroughfares of Metro Cebu when the DPS collection schedule was disrupted due to the circumstances.
	-*Tri-sikad*	Nine (9) tricycles	Collect garbage within the specific area of Metro Cebu in which DPS Garbage Trucks are no longer available.
	-Garbage Bins		
	-Push carts		Used to gather wastes from Carbon market are sent to the transfer station in DPS Headquarters for direct transfer of waste to dump trucks.
3. Treatment	Chemical and/or organic Deodorizer	Periodic use	Odor Removal at the landfill area Used also for composting
4. Disposal	Sanitary landfill	One (1)	Built based on the semi-aerobic design. Landfill gas is vented through a series of horizontal and vertical pipes. However, the leachate treatment pond serves only as an impounding basin, which discharges partially treated leachate to the surrounding area; [95]
	Weighing Bridge	One (1)	Located in the Inayawan landfill, large, floor mounted weighing scale systems that can weigh entire vehicles and their contents. By weighing the vehicle, both empty and when loaded the load carried by the vehicle can be calculated. The weighing bridge is now an ordinary passage going inside the Landfill as it is no longer functional.
5. Waste Recovery and Recycling	Manual waste recovery from streets and open areas		Simple implements are used by undetermined number of waste pickers around the city
	Manual waste recovery from Landfill		Simple implements are used by more than 300 waste pickers in the landfill
	MRFs in barangays	Eight (8) MRFs	Temporary station for recyclables, serves also as segregation, processing and/or buying area for recyclables
	Minor crafts and products making		Making of bags, slippers, decorative items, etc.

[94] Jimmy A. Sienes III, Personal Interview, 2nd Week of June 2009
[95] Jimmy A. Sienes III, Personal Interview, 3rd Week of June 2009

Table 10. Continuation (2/2)

TYPE OF SERVICE	TECHNOLOGY		
	TYPE	NUMBER	IMPORTANT FEATURES
Waste Plastic from Industrial Sector			
1. Source Reduction			
2. Collection			
3. Transportation	Mantech[96]	-1 unit Mitsubishi Multi-lift Truck -2 units statutory portable compactor -1 unit Isuzu Forward 195hp Garbage Roll Compactor Truck -1 unit Isuzu Elf 110Hp Garbage Roll Compactor -3 unit 6 Wheeler truck	-self loading and unloading with a detachable garbage roll compactor receiver with a packing capacity of 8 tons compacted dry and 12 tons compacted wet; -capacity of 40cu.m. (compacted dry) and 60cu.m. (compacted wet) -Self compress and unloading with packing capacity 10cu.m. dry and 20cu.m. wet; -Self-compress and unloading with packing capacity 10cu.m. dry and 20cu.m. wet; -with fence back load capacity of 5 tons wet and 3 tons dry;
4. Treatment	CCTF		Only for wastewater of electroplating companies
5. Disposal	Inayawan Sanitary Landfill		
6. Waste Recovery and Recycling			

[96] Man-Tech Company Profile 2009

5.5. Stakeholders Participation

It is a common misconception in the Philippines that once garbage is removed from the house it is no longer a concern of the generator. Their main worry is efficiency in garbage collection and many have objected to establishing sanitary facilities in their locality. This 'not in my backyard' or NIMBY mentality has been causing siting problems for common disposal areas. Lately, waste generators are starting to play a major role as stakeholders in SWM. Many generator-initiated projects have started with little help from local governments. NGOs act as service providers since they supply the necessary know-how in installing community-based waste management (CBWM) projects. They have also started recycling and recovery projects. Other service providers such as waste collectors and transporters can improve the efficacy and efficiency of solid waste management by continuous interaction to bring improvements in the system. With many more actors taking part in the SWM chain, the government's regulatory role becomes even more relevant.

Continuous interface with the different sectors and clarified roles are necessary for efficient delivery of services and the improvement of the system as a whole.

5.5.1. Waste Generators

5.5.1.1. Households

Through homeowners' associations, households are represented in the BSWMC. Both the city government and barangays conduct public information activities and distribute leaflets to households to inform them and encourage their participation in the LGU's program on environment and sanitation. The leaflets include basic information on solid waste management, prohibited acts under national and local laws, fines and penalties and contact information of DPS, CESET and the specific barangay who gives out the leaflets[97].

5.5.1.2. Private Establishments

The private sector has three representatives in SWM Boards, ensuring that their stake and perspective in SWM planning is considered at all levels. Some initiate their own SWM projects to encourage other sectors to participate.

5.5.1.2.1. The Philippine Environment Partnership Program (PEPP)[98]

The PEPP, is a DENR partnership program with industries, in cooperation with the other environment-related agencies, pursuant to DAo 03-14. Its purpose is to promote mandatory self-monitoring and compliance with environmental standards and to encourage voluntary self-regulation of industrial

[97] Barangay Luz, SWM Information Leaflet "Dakpon ka! Pamultahon ka! Mabilanggo ka! 2009"
[98] Environmental Management Bureau Official Website" 18 June 2009, http://www.emb.gov.ph/pepp/index.html#

establishments. It also seeks to provide incentives and package of assistance to establishments particularly SMEs to achieve pollution prevention and cleaner production process and to build or enhance the capability of establishments and/or their associations on self-regulation.

All establishments that are governed by relevant environmental laws, rules and regulations such as industrial and commercial establishment, in general, both public and private, including agri-industrial facilities, manufacturing and commercial enterprises and other facility services are covered under this program. Participation could be through individual establishments or industry associations.

5.5.1.2.2. SM City Cebu

The Green bag is a national program for SM, the biggest mall chain in the country. This program was launched simultaneously in SM Malls, including SM City Cebu. It aims to reduce single-use plastic bags given to customers of the department store and supermarket.

In 2007 they sold the Green Bag for only P35.00 for a certain purchase. Now the bag can be bought without any purchase needed from any of the stores. This July, the malls have also launched the My Own Bag (MOB) Campaign wherein the shoppers are encouraged to bring their own bag in the grocery. Aside from the Green Bag, color-coded garbage bins are also placed through the mall to encourage mall goers to segregate. It is also part of SM's ongoing environmental information campaign.[99]

[99] Personal observation

Figure 5. Solid Waste Management Initiatives in SM City Cebu

Color-coded garbage bins

SM Green Bag Campaign

5.5.1.2.3. Cebu Holdings, Inc. (CHI)

To involve both establishments and residents in CHI's environmental program, participation was encouraged in the CBP-NBAAI. All merchants based in Ayala Business Park and Asia Town IT Park Cebu, and other commercial establishments under Cebu Holdings Inc. are currently involved in the program. To initiate this, CHI donated a garbage truck each to Barangays Luz, Careta, Hipodromo, Mabolo, Apas and Kamputhaw through the CBP-NBAAI.

Ayala Foundation also forged partnerships with the Asian Institute of Management, Ayala Land, and Ayala Property Management Corporation for the Ayala-AIM Environmental Capacity Building Program. Under this program, AIM will develop an environmental course for urban planners and building designers from the government and private sectors. Bringing in the experience and expertise of the Ayala group in solid waste management, this partnership is expected to evolve into a Center for Environmental Excellence, which will act as a catalyst in shaping urban environmental policy and practice.[100]

5.5.2. Service providers

5.5.2.1. Mantech

There are many SWM service providers operating in the Province of Cebu and the City as well. However, most of them are unlisted and/or unwilling to be interviewed.

[100] ‹http://www.cebuholdings.com/View0urcommunity.do›

Only Man-tech willingly shared their information. Mantech, although based in Mandaue, serves commercial establishments in Cebu.

5.5.3. Government

5.5.3.1. In the same light, President Arroyo signed the **Executive Order 774- Reorganizing the Presidential Task Force on Climate Change (PTFCC)** on December 26, 2008. E.O. 774 required 50% reduction in solid waste generation for the next six months. E.O. 774 identified the DENR to lead a SWM Task Group and enjoined all local governments to fully implement the law on solid waste management.[101]

Government agencies, from the NSWMC down to the local SWM boards, are mandated to conduct, trainings, seminars, release publications and tri-media materials and conduct information and enforcement activities to encourage various sectors to participate in solid waste management. One of such programs are the Zero Basura Campaign.

5.5.3.2. Zero Basura Olympics Philippine Garbology Marathon 2008[102]
ZBO was initiated to mobilize participation of different sectors and to encourage LGUs to comply with RA 9003. It will be a nationwide contest that will involve not only the LGU but different sectors as well. Its objectives are as follows:

1. To promote multi-stakeholder cooperation to attain and sustain ESWM Programs at the LGU-wide level
2. To assist LGUs in the formulation and implementation of an effective and doable ESWM program thru a social mobilization program
3. To identify, validate, document and recognize different stakeholders and LGUs successfully implementing ESWM Programs
4. To highlight and recognize novel and creative ESWM approaches that can serve as models for other LGUs to learn from
5. To develop a self-monitoring system for LGUs to track and benchmark compliances with RA 9003 and incorporate the same in DILG's Local Government Performance Measurement System (LGPMS).

The three categories for LGU contestants is based on the IRA allotment to facilitate an even-handed evaluation among LGUs within the same income levels. The first category is the Highly Urbanized and Component Cities, second is the First to Third Class Municipalities and last is the Fourth to Sixth Class Municipalities. The winners will be awarded in August 2009.

[101] "E.O. 774", May 15, 2009, ‹http://www.ops.gov.ph/records/issuances-eo/EO774.pdf›
[102] Zero Basura Olympics Philippine Garbology Marathon 2008, July 18, 2009‹http://server2.denr.gov.ph/files/jointmc-denr-dilg-2008-01_745.pdf›

Intensifying Zero Basura campaign[103]

President Arroyo recently directed the PTFCC to intensify the Zero Basura Campaign and called on LGUs to set up MRFs at the barangay level. She informed local officials present during the briefing that compared to open dump site and sanitary land fills, the MRF is the best alternative solution to mitigate climate change. She also asked the DENR to assist municipal and city governments in financing the establishment of MRF's in their areas of jurisdiction. At the briefing, Undersecretary Geroche informed the President that the DENR is ready to provide a cash grant equivalent of 20 percent up to 50 percent of the total expenses needed for the establishment of MRF at the barangay level. He said each MRF is worth P183,000.00

Cebu City, however, is no longer qualified for this subsidy since it is a chartered city and not qualified for the released Php 100 million to the provincial government for the SWM programs of component cities and municipalities.

5.5.3.3. SWM MOA among Cebu LGUs[104]

Another approach to intensify involvement of different sectors in SWM is the MOA entered into by 51 mayors of Cebu LGUS in July for a joint implementation of SWM called Disposal of Garbage and Waste Enforcement for Nature (D'GWEN) and Vermiculture Composting Programs, the initiative is a collaboration among LGUs for a systematic garbage recycling and composting program. Provincial Governor Gwendolyn Garcia said the provincial government will support the LGUs, especially the barangays, by giving capital assistance for garbage reduction and segregation programs. The provincial government will provide P15,000.00 to each barangay, to be taken from the Php 100 million seed money President Arroyo alloted to the provincial government for SWM.

Each barangay and town will have their own account with the Development Bank of the Philippines and will be issued individual ledgers. DBP will help monitor the accounts. Revenues from the program are not allowed to be used for at least a year. Under the agreement, the towns will purchase recycled materials from the barangays and the province, in turn, will buy recycled materials from the towns.

5.5.4. Summary Data Sheet

Table 11 summarizes the process and level of stakeholder participation in SWM in the city. Measures should be taken to encourage waste generators and LGUs to comply and go beyond mere compliance in proper treatment and disposal of wastes.

[103] PGMA to PTFCC: Intensify the Zero Basura Campaign Friday, 14 August 2009 ‹http://www.gov.ph/index.php?option=com_content&task=view&id=2001435&Itemid=2›

[104] Cebu Mayors ink joint agreement for solid waste management By MARS. W. MOSQUEDA JR. July 23, 2009, 7:16pm ‹http://www.mb.com.ph/articles/212437/cebu-mayors-ink-joint-agreement-solid-waste-management›

To many residents, waste treatment and disposal seemed to a territory of the LGUs and not their own. Yet, ideally, waste generators should be active in participating in all levels of the waste management chain, from mere compliance to vigilance on the compliance of other sectors.

Regulatory institutions, on the other hand, face difficulties in monitoring and enforcement, mainly because they lack human and financial resources to do so. Recently, two major issuances did little to elicit major response from concerned LGUs. First is the 3-Strike Policy issued in 2008 to non-complying LGUs and second is the EO 774 wherein another six-month ultimatum was given to LGUs regarding the closure of their open or controlled dumpsites. Lest the LGUs become anesthetized on such issuances, the government should take on more innovative and proactive approaches to get LGUs to comply.

Industries' solid waste management is mainly self-monitored because regulatory bodies like the EMB do not have the capability to examine the performance of individual companies.

NGOs like Sagip Pasig Movement (based in Manila) embarked on a public disclosure program or shame campaign to expose to the public industries not complying with effluent standards. Using data from the periodic monitoring of EMB Manila, the list of top polluters were given to the media. SPM then called on the public to boycott the products of the polluting industries. The campaign has resulted to major impacts in industry environmental performance in Metro Manila. Later, it gave birth to numerous enabling partnerships between SPM, their partner communities and former Lason sa Ilog (Poison to the River) Awardees.[105]

It is certainly acceptable to engage in such radical measures to reiterate the urgency of RA 9003 compliance. However, this time, LGUs will be the ones at the receiving end.

[105] Personal observation as SPM consultant.

Table 12. Stakeholder Participation in Solid Waste Management, Cebu City (1/2)

TYPE OF SERVICE	MAJOR STAKEHOLDERS	MEASURES TO IMPROVE PARTICIPATION	PARTICIPATION
Waste Plastics from Residential and Commercial Sector			
Representation in policy and planning development	-Homeowners Associations -Parent Teachers Associations -Government Institutions -Commercial Establishments -Haulers, Transporters, Recyclers Buyers	Representation in various institutions such as: City SWM Board Barangay SWM Board	-Sectors represented in relevant SWM Bodies Although actual and effective participation and yet to be assessed.
Source Reduction	LGUs through PSWMB, CSWMB and BSWMC NGOs Schools Commercial Establishments i.e. malls	Trainings, Public Information Campaigns for Waste Reduction at source Ex. Green Bag Campaign	-LGUs, NGOs and corporate foundations take lead in SWM Public Info Programs Wider reach of these initiatives still required to mainstream source reduction
Collection and Transportation	Private Haulers, transporters DPS-Waste Collection Unit Barangay Eco-aides Waste Generators	Regular schedule of collection Regular pick-up points Continuous dispatch of collection crew	-Due to regular schedules and pick-up points, waste generators are encouraged to comply. Continuous information of schedules and other information needed.
Treatment	DPS Private Service Providers Waste Generators (Hospitals, etc.)		-Merely compliance or lack of, needs more proactive approach
Disposal	DPS Private Service Providers Waste Generators (Hospitals, etc.)		-Merely compliance or lack of, needs more proactive approach
Recovery and Recycling	-Regulators: DPS, CSWMB, BSWMB -Waste generators: -Service Providers: -Junk shops, buyers, recyclers -NGOs -Commercial Establishments -Waste Pickers (Ex. GKKLPMPC)	Trainings and Workshops Public Information activities Cooperative formation	-Taking lead -Majority not being reached -Must be monitored regularly -Must mainstream the industry -Initiating small scale projects -Must take more active role -Active but not given safety and security
Monitoring and Enforcement	-NSWMC -PTFCC -LGUs	Monitoring of SWM Plans EO 774 Zero Basura Campaign	-Undermanned, not enough resources -More vigorous enforcement needed
Cooperation	International Organizations Government Finance Institutions Local Government Units	Grants, subsidies, joint projects Ex. D'GWEN (Cebu LGUs MOA on SWM)	-Limited window for support -Lack of resources and tech capability to

Table 12. Continuation (2/2)

TYPE OF SERVICE	MAJOR STAKEHOLDERS	MEASURES TO IMPROVE PARTICIPATION	PARTICIPATION
Waste Plastics from Industrial Sector			
Source Reduction	Individual industrial establishments Corporate organizations such as PBSP, PBE, Cebu Chamber of Commerce Cebu Business Council	ISO Certification Corporate standardization Corporate Social Responsibility Projects Joint Programs and Projects	-Needs more proactive, green production approaches -industry waste generators should take lead in source reduction as it is an upstream sector in the SWM chain.
Proper Disposal	Individual industrial establishments	Self-Monitoring Reports PEPP	-Merely compliance or lack of, needs more proactive approach -Smaller establishments lack know-how and resources
Recovery and Recycling	Individual industrial establishments Corporate organizations such as PBSP, PBE, Cebu Chamber of Commerce Cebu Business Council	Specific Projects for both individual and corporate organizations Corporate Social Responsibility Projects	Companies usually have their contract buyers of scrap materials so majority of recycling is not done at their end.
Waste Plastics from Specific Wastes such as E-waste			
Recovery and Recycling	Industries Commercial Establishments NGOs Waste Generators	Balik Cellphone Trash for Cash IWEX	Not yet mainstreamed, minimal participation

6. HAZARDOUS WASTE MANAGEMENT SYSTEM

6.1. Policies

The most comprehensive law in country addressing hazardous and health care waste (HCW) is **R.A No. 6969** known as, "An Act to Control Toxic Waste Substances and Hazardous Waste and Nuclear Waste Control Act of 1990." The law mandates the regulation, restriction and prohibition of the importation, manufacture, processing, sale, distribution, use and disposal of chemical substances and mixtures that present unreasonable risk and/or injury to health or the environment. It also prohibits the entry, even in transit, of hazardous and nuclear wastes and their disposal into the Philippines for whatever purpose. The law seeks to provide advancement and facilitate research and studies on toxic chemicals and hazardous and nuclear wastes (Sec 2).[106]

A Joint DENR-DOH Administrative Order was issued in 2005-02 **JAO 05-02** to address HCW, establishing the proper guidelines and policies for the treatment, storage and disposal (TSD) of HCW. The order was issued pursuant to RA 6969 and other applicable laws, such as the RA 9003, PD 856 (Refuse Disposal of the Sanitation Code of the Philippines) and RA 4226 (Hospital Licensure Act).

The administrative order recommends various treatment methods for health care wastes: thermal, chemical, irradiation, biological processes, encapsulation, and inertization, as outlined in the DOH HCW Management Manual. HCW generators and TSD facilities are required to meet specified treatment standards. Treated wastes and inert residues from TSD facilities can only be disposed in controlled disposal or sanitary landfill facilities duly licensed by the DENR.[107]

DAO 24-98 Interim Guidelines for the importation of recyclable materials containing hazardous substances (Amending Annex A of DAO28 Series of 1994 Interim Guidelines for the Importation of Recyclable Materials Containing Hazardous Substances)

6.2. Institutions

As the NSWMC is the leading body instituted to regulate and monitor solid waste management, for hazardous and specials wastes, the **DENR-Environmental Management Bureau** is in charge of hazardous waste management. EMB's envisions a 'nation empowered to protect our finite natural resources, attuned to the pursuit of sustainable development, for a clean and healthy environment that enhances the Filipino quality of life for a present and future generations'. Its mission is to restore, protect and enhance environmental quality towards good public health, environmental integrity and economic viability.[108]

[106] "RA 6969 An Act to Control Toxic Waste Substances and Hazardous Waste and Nuclear Waste Control Act of 1990." May 4, 2009 ‹http://www.emb.gov.ph/laws/toxic%20substances%20and%20hazardous%20wastes/ra6969.PDF
[107] Philippine Environmental Updates By: Jocelyn J. Gregorio-Reyes Quisumbing Torres Manila, Philippines June 2006 ‹ http://www.bakernet.com/NR/rdonlyres/242DB930-BD3F-4421-A9F9-C46E6FABEA3E/0/2006_IEC_Philippines_Country_Paper.pdf›
[108] "Existing EMB-DENR Organizational Structure," 29 June 2009, ‹http://www.wepa-db.net/pdf/0712forum/presentation03.pdf›

The EMB is mandated to implement on the nationwide scale the Clean Air Act, The Clean Water Act, the Hazardous Waste Act, The Solid Waste Management Act and the Environmental Impact Statement System., among other environmental laws.

Under E.O. 192, the EMB is also mandated to conduct education and information services; provide research and laboratory services; and serve as secretariat in the adjudication of pollution cases.[109]

6.3. Financing Mechanisms

DAO 92-29 Administrative violations as provided for under Section 41 of related to hazardous waste management is hereby amended to include but not limited to the following: [110]

A) Administrative violations as provided under section 41 of DAO 92-29 related to the hazardous waste management is hereby amended to include but not limited to the fallowing: a) failure to provide appropriate information to the DENR upon registration;	Php 10,000.00 Php 50,000.00
B) Submission of documents containing false information;	
C) Failure to comply with the reporting requirements under the law;	Php 10,000.00
D) Failure to comply with the conditions of a permit, except those specified herein	Php 50,000.00 Condition violated
E) Failure to comply with labelling requirements;	Php 50,000.00
F) Failure to place placards on the conveyance/vehicle	Php 50,000.00
G) Failure to comply with subpoena or subpoena duces tecum issued by the Secretary or his duly authorized representative;	Php 50,000.00

In addition to the above common violations, the following shall apply to:

Waste generators:

a) Failure to submit a completed copy of the Hazardous Waste Manifest Form to the DENR;	PHP 50,000.00
b) Performs the function of a TSD Facility without the appropriate TSD Facility Permit	Php 50,000.00

TSD

a) Accepts hazardous waste without the proper manifest;	Php 50,000.00
b) Stores, recycles, reprocesses, treats or disposes of hazardous waste at a TSD facility without the appropriate TSD facility permit;	Php 50,000.00
c) Failure to notify the DENR of the Residuals generated as a consequence of its recycling, processing, or treatment activities	Php 10,000.00

Importers and Exporters:

a) Importing recyclable materials containing hazardous substances without securing import clearance from the DENR;	Php 50,000.00
b) Exporting hazardous waste or materials containing hazardous substances without securing an export clearance from the DENR	Php 50,000.00

[109] Ibid.
[110] "DENR AO 92-29, Prohibited Acts and Penalties", 19 June, 2009< http://search.yahoo.com/search?fr=ytff1-msgr&p=Chapter%208%20Prohibited%20Acts%20and%20Penalties%20DAO%2092-29&ei=UTF-8&type=>

Title III- Hazardous Waste of RA 6969 prescribed fees for various activities. In this regard, paragraph B of DENR Memorandum Circular No. 2000-12 is amended as follows;

1. Registration of hazardous waste generators	P600.00/generator
2. Annual Registration of Transporters	P500.00/vehicle
3. Issuance of Manifest Form	P100.00/manifest P500.00/hazardous material
4. Application fee for Notification of the Export of Hazardous Wastes	P500.00/notification
5. Registration Fee	P15,000/facility
6. TSD Facility Permit	P5,000.00/facility
7. Issuance of an Export Clearance	P2,000.00/clearance
8. Issuance of an Importation clearance	P2,000.00/clearance
9. Registration of Importer of HW	P5,000.00

The fees shall be collected by the Authorized Collecting Officers of the Environmental Management Bureau upon release of the registration certificate/ permit/clearance.

Penalties:

- Administrative violations of Section 41 of RA 6969 IRR, and fees
- 10,000 to P50,000
- Criminal offenses of Section 42 (1) of IRR, and penalties
- P600 to P4,000, and 6 month to 6 years imprisonment
- Criminal offenses of Section 13 (d) of RA 6969 Act, and penalties
- 12 to 20 years imprisonment (persons) 12 to 20 years imprisonment and at least P500,000 (corporate)

Common Treatment Facility located at the CTF/SSF Site, beside the Cebu Sanitary Landfill Compound, Inawayan, Cebu City. The CCTF is a common service facility for toxic and hazardous wastes has been built using funds from the private sectors, the Development Bank of the Philippines (DBP), and the German Agency for Technical Cooperation (GTZ).
The Cebu Common Treatment Facility responds to the need for a waste treatment facility for toxic and hazardous wastes coming from the electroplating industry in Metro Cebu. There are around 60 companies engaged in electroplating, discharging five cubic meters of wastewater per day. The CCTF treats the following materials:

- Waste with cyanide (A101),
- acid wastes (B201-B299),
- alkali wastes (C301-C399),
- waste with inorganic chemicals (D401-D499),
- waste oil [interceptor sludge, oil and water mixture] (I101),
- inks, dyes, pigments, paints, latex, adhesives, organic sludge (F601-F699)[111]

[111] Investments for a Cleaner Environment: Issues, Problems and Prospects Related to the Financing of a Common Treatment Facility for Toxic and Hazardous Wastes from the Electroplating Industry in Metro Cebu, Philippines., Sol Eharle, 2007

6.4. Technology

6.4.1. Cebu Common Treatment Facility[112]

Considerable advances have been made at treating wastewater from the electroplating industry in Metro Cebu with the establishment of the Cebu Common Treatment Facility. However, since it treats industrial wastewater, a detailed discussion of the technology is not needed here.

6.4.1. Pollution Abatement Systems Specialists, Inc. (PASSI)[113]

PASSI was established in 2004 by a group of mechanical engineers is the only private hazardous waste disposal operator in Cebu. It is a licensed treatment facility for hospital and hazardous wastes which utilizes the autoclaving, a process that destroys infectious organisms through steam and heat pressure to disinfect it. The waste is then sealed in receptacles and buried underground. PASSI insists autoclaving or microwave incineration is the only allowed method of disposing hazardous and pathological wastes.

PASSI chairman Antonio Tompar earlier planned to shut down their Cebu operations because of the huge losses they have incurred for the past years. He said that the facility can treat up to 2,000 kilos of hospital waste and other hazardous wastes. However, only around 26 health establishments make use of their services.

Vivencio Ediza, the DOH official in charge of monitoring hospital waste disposal, said the methods are still very expensive and "impractical."[114]

6.4.3. Chemical disinfection[115]

The biggest hospital in the Central Philippines, the government-owned Vicente Sotto Memorial Medical Center, said it is strict with chemical disinfection of their waste but admitted this could not be enough to properly dispose of the pathological and hazardous wastes like body parts, tissues, tumors and used medical supplies and chemicals.

6.5. Stakeholders' Participation

Stakeholders in hazardous and hospital care waste mainly include industries, hospitals and clinics. Stakeholder participation is encouraged through monitoring of DENR-EMB and incentives to avail of treatment services.

[112] Ibid.
[113] "Services of hospital waste treatment facility extended", The Freeman, 11 July 2009 ‹http://www.philstar.com/Article.aspx?articleid=450561›
[114] "Cebu eyes medical tourism but concerned about hospital waste" By ‹Wilfredo Rodolfo 36 June 2009›
[115] Ibid.

7. SYSTEM IMPROVEMENT MECHANISMS

7.1. SWM Planning

Solid waste management bodies such as the NSWMC, PSWMB, CSWMB, BSWMC are mandated by RA 9003 to develop plans for efficient and effective solid waste management in accordance with the National Solid Waste Management Framework.

7.2. Green Production

The role of the business and industry sector in developing environment-friendly practices is encouraged. Section 57 of RA 9007 states that the NSWMC 'shall encourage commercial and industrial establishments, through appropriate incentives other than tax incentives; to initiate, participate and invest in integrated ecological solid waste management projects; to manufacture environment-friendly products; to introduce, develop and adopt innovative processes that shall recycle and re-use materials; conserve raw materials and energy, reduce waste, and prevent pollution, and to undertake community activities to promote and propagate effective SWM practices'.

7.3. Research and Development

RA 9003 supports the conduct of research and development activities to improve services and technologies related to solid waste management. It states that the DENR, after consultations with the cooperating agencies, shall encourage, cooperate with and render financial and other assistance to appropriate government agencies and private agencies, institutions and individuals in the conduct and promotion of researches, experiments, and other studies on solid waste management (Sec 54).

7.4. Training

To ensure continuous and efficient implementation of SWM plans and programs and projects, training will be provided to stakeholders. The National Ecology Center is established provide consulting, information, training, and networking services (Sec7). Relevant personnel such as waste collectors will be given necessary training to ensure that the solid wastes are handled properly (Sec 23b).

Personnel assigned to operate the disposal site shall be adequately trained regarding site operation and maintenance, hazardous materials recognition and screening and heavy equipment operations, with emphasis on safety, health, environmental controls and emergency procedures. A record of such training shall be placed in the operating record (Sec 42m).

7.5. Monitoring and Enforcement

Monitoring of SWM plans shall be the function of the instituted SWM bodies according to RA 9003. Enforcement is under the DENR and relevant units, specifically the newly-established Task Force Kalikasan (TfK). Through DAO 08-01, the DENR Secretary created the Tfk, under the Office of the DENR Secretary, as the lead implementing unit in the enforcement of various laws, rules and regulations of the Department. The Task Force is responsible for the enforcement of all environmental laws, whose responsibility is vested in the Department, including RA 9003, and RA 6969, among others.

Initial funds for TfK operations is taken from the Office of the Secretary. For 2009 and thereafter, TfK funds shall be taken from the regular budget of the Department, as may be proposed and approved in the General Appropriations Act, as well as from other appropriate sources.[116]

8. CASE STUDY-BARANGAY LEVEL WASTE MANAGEMENT SYSTEM

Brgy. Luz Solid Waste Management Program[117]

Brgy. Luz is one of the biggest barangays in Cebu City with an area of 199,858 hectares, 16 *Sitios* and population of 15,545. A total of 42 organizations operate within the barangay.

Brgy. Luz used to be faced with solid waste disposal. Population growth contributed to the rapid increase of waste disproportionate to the collection and disposal, and capability of the barangay. The Brgy. Council, with limited funds, purchased one compactor truck and one dump truck. Garbage collection was scheduled in every sitio of the barangay to at least minimize and neutralize the problem.

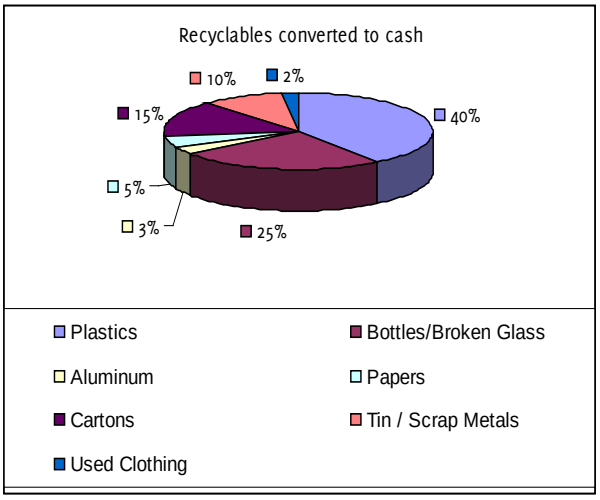
R.A. 9003 inspired the Barangay Council to come up with a program to strengthen the participation of the POs and the NGOs, particularly the Brgy. Luz Homeowners Multi-Purpose Cooperative (BLHMPC). Massive information campaign as well as seminars and trainings aimed at disseminating the program to homeowners' associations, women's groups, schools and assemblies were conducted. The program aims to improve the quality of life of residents through a balanced ecology and sustained community development. It hopes to educate the community in waste minimization through proper waste segregation to help extend the life span of Inayawan Landfill, provide better health services, eradicate respiratory diseases and promote a garbage-free

Table 13. Selling Price of Recyclables, Brgy. Luz

PER KILO		PER PIECE	
Aluminum:		Bottle:	
Nipis	40.00	Long Neck	1.00
Baga	50.00	Lapad	.75
Cans	40.00	Kulafu	.50
		Jr. Lapad	.50
Bronze:		Patis	.80
Yellow	55.00	Catsup	.25
Red	65.00	Garapa	.20
		Efficasent	.50
Plastic:		Litro	2.50
Blowing	7.00	Coke Reg.	1.00
Natures Spring	5.00	SM Grande	2.50
Baga	1.00	SM Pilsen	1.00
Tinga	10.00		
Bildo	.50	Newspaper:	
Puthaw	5.00	Local	1.00
Car Plate	3.00	National	1.50
		Asstd. Carton	.50

Source: Bgry. Luz SWM Presentation, 2005

Figure 6. Percentage of Recyclable Materials Sold



[116] Task Force Kalikasan, July 18, 2009, http://server2.denr.gov.ph/files/dao-2008-01_967.pdf
[117] Based on the Presentation of Luz Cabrera, Regional Training on Gender Equality in UEM, 28-30 March 2005,

environment. The program also promotes *bayanihan* savings mobilization and eventually supports economic activities in the community.

Information and Education campaign on Kwarta Sa Basura Program (KSBP) and *Bayanihan* Savings Replication Program (BSRP) were conducted through community association meetings. Community orientation was done in 15 *sitios* of the barangay. A *Bayanihan* Center was formed in every sitio and elected its own set of officers. The training included topics on Waste Segregation, City Ordinance No. 1361 and RA 9003.
To promote the program, the barangay conducted the Clean & Green Contest for the Cleanest Sitio; Products from Waste Contest; Contest for the Highest Number of Kilos Segregated per Cluster; Contest for Sustainable & Manageable Composting Centers. An important part of the program is strict enforcement of the law, especially of City Ordinance 1361 and R.A. 9003.

The money generated from the recyclables was deposited to accounts that earn interest of 7% per annum that can be used as a capital build-up for business. It can also be used as collateral for BLHMPC loans.

Re-used and recycled plastics are made into flowers, bags, plant hangers, flower pots & slippers. For project sustainability the organization coordinated with NGAs, NGOs, and other sectors. Promotion through incentives, in cash or in kind were also considered. Brgy. Luz Women's Network joined the campaign and advocacy in promotion through product fairs and initiate individual skills creativity for re-use and recycling. Campaign posters and materials were made for this purpose.

Table 14. Total No. of Kilos Segregated & Sold

MONTH	TOTAL IN PESOS	TOTAL IN KILOS
October '02	1,015.10	338.4
November	1,014.75	338.3
December	2,869.50	956.5
January '03	1,150.00	383.3
February	1,200.00	400
March	1,025.00	341.7
April	1,625.00	541.7
May	408.25	136.1
June	4,731.60	1,577.2
July	9,095.75	3,031.9
August	8,717.15	2,905.7
September	13,405.34	4,468.4
October	13,125.50	4,375
November	21,003.00	7,001
December	11,861.78	3,953.9
January '04	10,856.20	3,618.73
February	12,463.15	4,154.38
March	20,785.08	6,741.41
April	16,785.08	5,595.02
May	17,618.76	5,872.92
June	106,558.40	35,519.47
July	129,199.27	43,066.42
August	144,524.64	48,174.88
September	165,546.35	55,182.12
TOTAL	716,584.65	238,674.45

Gains and Achievements

Brgy. Luz was able to train and organize a pool of trainers for CBWM. It generated income for the community through livelihood programs. As of September 2004, it sold 238,674.45 kilos of the most common recyclable wastes including bottles, plastics, aluminum, zinc, and scrap irons amounting to Php 716,584.65. It also developed and sold products from waste materials including bags from juice packs, hats from plastic gallons, sandals made from juice packs and flower vases made from papers.

One of the most important accomplishments is the technology transfer and replication of the program to 23 barangays in Cebu as well as promotion of solid waste management awareness through information dissemination through various media.

9. POLICY PROSPECTS

9.1. Proposed National Policies

Two bills pending in the Philippine Congress and Senate deal with plastic wastes reduction. In Congress, Rep. Al Bichara proposed **House Bill 4134** that pushes for the imposition of a P2.50 excise tax on every plastic bag. The collected excise tax on plastic bags will be funneled to an "environmental protection support fund", and to fund anti-pollution projects, and develop eco-friendly waste management and landfill systems.[118]

Senator Miriam Defensor-Santiago, filed Senate Bill 1443-Plastic Bag Recycling Act. The proposal seeks in-store recycling program to allow consumers to return their plastic shopping bags for recycling. It also encourages the stores to make reusable bags available to shoppers.
While these bills are still pending the Lower and Upper Houses of Congress, most department store and grocery chains in the country have started their own campaigns on reusable plastic bags. SM's chain of malls has initiated the Green Bag Program in 2007. Rustans and Robinsons Grocery Stores have followed suit with their own reusable bags. Further, SM has piloted the once-a-week My Own Bag (MOB) campaign every Wednesday starting July of this year.[119]

These developments in policy and practice are slowly transforming the way people view the single use shopping bag. Although both will significantly impact plastic waste generation, these do not sufficiently address the huge amount of plastic waste generation in the country, especially in major cities like Cebu and Mandaue.

9.2. Pending Local Ordinances

On May 28, 2008, Cebu Councilor Nestor D. Archival filed proposed an ordinance to reduce and regulate the use of plastic bags and packaging materials. It is now on its second reading. *"An ordinance regulating the use and sale of plastics, Styrofoam, packaging materials and institutionalizing the use of biodegradable containers and native bags within the territorial jurisdiction of Cebu City"*[120]

Cebu City Proposed Ordinance -"The Local Environment Code of Cebu City"
SECTION 6. - It is the policy of the policy of the Government of the City of Cebu to promote and preserve the good health of its constituents so that all efforts of the citizens and of the government should be harassed and directed towards the full realization and implementation of such policy.
SECTION 7. - The citizens shall have the primary responsibility of achieving and maintaining cleanliness in their places of abode or work while the government shall suffer the ultimate

[118] "House bill eyes excise tax on plastic bags" by Dino Maragay, 10 July 2009 ‹http://www.philstar.com/Article.aspx?articleid=462090›
[119] Personal observations
[120] "Cebu City Proposed Ordinance, An ordinance regulating the use and sale of plastics, Styrofoam, packaging materials and institutionalizing the use of biodegradable containers and native bags within the territorial jurisdiction of Cebu City" May 11, 2009

responsibility of establishing and maintaining an orderly and modern program for the collection and disposal of garbage, rubbish, swill, trash and other forms of waste and waste materials.
SECTION 40. - Management scheme for generators- The following undertakings shall be strictly observed to ensure the efficient and effective implementation of solid waste management in the City.[121]

All of these proposed policies will impact plastic waste generation and management once enacted.

10. ISSUES AND RECOMMENDATIONS

The fundamental problem in the waste plastic management in the Cebu City, or the country for that matter, is the lack of it. There is simply nothing to assess, in specific terms in the areas of policy, financing, enforcement, regulatory institutions, and technology. Waste plastics management in the country is so subsumed in the municipal solid waste management that one might have the impression that there is a so-called waste plastic management system somewhere in the MSW chain.
The current segmented and often puzzling chain of practices in the generation, handling, disposal and recovery of waste plastics could hardly be called a system and is largely under a more obscure engagement of the informal sector. Although there is a regulatory institution, a couple of international agreements wherein waste plastic is taken up and token reference to waste plastics in national and local policies, there are various issues to be addressed in the municipal solid waste chain to address waste plastics management. In this light, the issues and gaps in the municipal solid waste management system is discussed first before specific concerns on plastic waste management are addressed.

10.1. Policy

Conflicting policy at the international and national levels is one of the major issues to be dealt with. As signatory to the Basel Convention, and with a policy on hazardous waste management (RA 6969), the Philippine Government's engagement in JPEPA remains in question. Based on experience, even before JPEPA was formalized between the two countries, the Philippines has received (and returned) container vans of waste misrepresented as simply post consumer recyclable products.[122]. If safeguards against the importation of waste from Japan are not immediately established, the country might suffer the fate of –China with the influx of electronic waste and mixed plastic wastes.[123]

[121] Cebu City Proposed Ordinance, "An ordinance creating the Environmental Code of the City of Cebu and proving Penalties thereof" R-2008-006
[122] JPEPA: An Assessment, Policy Brief, Senate Economic Planning Office, Sept. 2007, 30 June 2009 ‹http://www.senate.gov.ph/publications/PB%202007-01%20-%20Japan-Philippines%20Economic%20Partnership%20Agreement%20(JPEPA),%20An%20assesment.pdf›
[123] "Exporting Harm, The High-Tech Trashing of Asia" The Basel Network Action, 22 May 2009 ‹http://www.preciousmetals.umicore.com/publications/other_related_documents/show_BAN_Report.pdf

On the other hand, the clarity of the main policy on municipal solid waste, RA 9003, is also its major downfall. So clear was the law in its time-bound compliance provisions that even first class LGUs like Cebu City is finding it hard to comply.

In the mid-90s, Cebu City constructed the first Integrated Sanitary Landfill Facility but operations have been mired by an array of technical, financial and administrative problems resulting to "open dumping in a sanitary landfill.[124]" Thus instead to developing from an open dump to a sanitary landfill pursuant to RA 9003, Cebu is faced with a sanitary landfill facility functioning as an open dumpsite.

The same is true for the provision on establishing mandatory solid waste diversion (Sec. 20). Since diversion and waste recovery is often un-documented in the current system, it is virtually impossible for the NSWMC to monitor how much LGUS such as Cebu City has been reducing or diverting from the dumps.

Based on the listing of MRFs in Cebu City, only 8 out of 80 barangays in the city have their own MRF. Segregation at source is not yet being practiced by the majority of waste generators.
Such targets seemed to have been formulated in haste and lacking consideration of local capacities to comply with. Also, there is an absence of measures to encourage reuse and recycling, diversion and recovery. With this lacking, LGUs will go on focusing on collection and disposal as their main priority.

10.2. Financing

For municipal solid waste, there are various economic tools present to fund the requirements provided by the law. These include annual SWM appropriations from the LGU, fees, fines, subsidies from public institutions, grants from international organizations and funding agencies.

There are many available economic instruments for solid waste management. However, it seems that the weakest among these tools are the regular appropriations the relevant government institutions receive. The budget of the NSWMC, for instance, is so small given the coverage of the Commission's role and functions. On the other hand, LGUs dedicate five to ten percent of their budget for solid waste management, but this mainly goes to the collection, transfer and disposal of wastes. A fleet of vehicles have to be maintained, fed fuel, and assigned crew of at least three personnel. Maintenance of the dumpsite also entails a huge budget, since only to remove the stench, the government has to spend millions annually.[125] The same amount could be used for various public information and education campaign to engage different sectors in the waste reduction, diversion, recovery

[124] THE METRO CEBU ENVIRONMENTAL IMPROVEMENT PROJECT By: Jun Erasmo E.Villafañe Officer-in-Charge, Environmental Technical Services Division Environmental Management Bureau – Region 7 Republic of the Philippines
‹http://kitakyushu.iges.or.jp/docs/network_meetings/kin1/Presentations/Session III/42 Cebu.doc›
[125] Such as the request of Councilor June Pe for Php 7 million to deodorize the landfill after the bidding for Inayawan's privatization failed in May of this year.

and recycling programs of the city. It could also be utilized to install basic community-based waste management (CBWM) systems. The existing budget is not only just not enough; its use is often misplaced priority.

Ironically, major impact of economic tools comes from program funds International funding agencies provide to the Philippine Government, the LGUs and even the private sector. Since it is part of their framework to engage in comprehensive programs and not in piecemeal or only in specific segments of SWM, their participation leave lasting impacts to stakeholders. Released in the forms of loans and grants, among others, these economic tools provide for the much needed fiscal requirements, where the government cannot.

One of the most important of economic tools is probably the most unattractive, these are the fees and fines resulting from enforcement measures. Although in quantity almost insignificant, they leave a lasting mark on violators' minds that the environment is not to be taken for granted or tampered with.

Even so, these financing mechanisms are never enough, since LGUs have more and more complex and sophisticated requirements what with the exploding population, increasing rate of waste generation, the emergence of cleaner SWM technologies. The key is to engage all possible sources and shift funding focus from collection and disposal to diversion and utilization. Waste converted to resource result to attractive monetary and non-monetary returns.

10.3. Enforcement

Specific to waste plastics, most prohibitions and penalties in general SWM also apply. However, one of the biggest challenges in enforcement is when another player comes, in the form of an economic partner. The Philippine government would better make clear of its commitment to the Basel Convention, in the light of the JPEPA.

Locally, the presence of CESET along the streets of the city has become a deterrent to doing SWM prohibited acts. People seem to know what they are about and what they are for. It is not uncommon to hear one say "Watch out, *naang* CESET" meaning a CESET enforcer is nearby.

In terms of health care waste, the city would have to be stricter and ensure that this waste stream is properly managed.

Figure 7. Hospital waste at Inayawan Landfill

Color-coded garbage bags from hospitals

Sharps and syringes along the street

The country has probably some of the most comprehensive environmental laws enacted to address the concerns of specific environments: air, water, solid waste, renewable energy, among others. However, there are difficulties in translating these laws to actual enforcement. Enforcement measures may have been laid out, regulatory institutions armed with standards, and warm bodies deputized. But in the question of enforcement in SWM is not just a question of laws but also of political will, of communicating and modeling values, of uprooting deeply ingrained culture of want and waste. These things take time to address.

The key to enforcement is education coupled with constancy, and a clear cut system. At the most extreme conditions, public disclosure can be used. The public can also exercise the citizen suit provision of RA 9003.

Better yet, stakeholders should be encouraged and given venue to engage and own the system, the project or the law, since this would minimize infraction. If compliance comes with value added, it becomes more attractive. This is the main strategy of CBWM projects, to set up projects that would benefit the community so the people will participate. Finally, incentives play a big role in compliance and should be used to the maximum.

10.4. Institutions

International development organizations such as CIDA, USAID, GTZ, ADB, provide various development tools to national and local governments in countries where they operate. These are mainly official development assistance agencies providing grants, aids, loans for major infrastructure and program development projects. They also provide technical assistance and capability-building support.

Government agencies and units such as the DENR-NSWMC and city and barangay governments are mandated to implement and enforce SWM laws in their jurisdictions. LGUs

have the role to plan, implement and monitor SWM. Each has to work to complement, not usurp or overlap the work of others.

NGOs and corporate foundations have varying frameworks for action. Some focus on poverty alleviation like the CBPNBAAI and PBSP while others work for the empowerment of the sector they serve such as Kaabag sa Sugbu and Lihok Pilipina. AS such they have different approaches in SWM projects. They provide only minimal monetary support but leave plenaty of know-how and capability after a project they have installed can be effectively managed by their partner community.

Service providers, on the other hand are very important stakeholders. Without their services, the solid waste management system will fail. However, since they are businesses with profit motivation, they should be strictly monitored.

The government can only do so much that is why each of these institutions has a specific role to play in SWM. However, there is no clear coordination or interface of these institutions. Instead one or two may be working with another. But regular in coordination and matching of capabilities and needs of all relevant institutions is barely conducted among them.

10.5. Technology

SWM technology in Cebu is mainly focused on collection, transfer and disposal. There are some major treatment technologies but for wastewater and hospital waste, however, not all generators needing their services avail of it.

The landfill is in dire need of update since even the most basic of equipment is not present where needed, such as the weigh bridge.

Vehicles and equipment needed for collection and transport are available and sufficient, since *barangays* have their own trucks to complement the DPS fleet. But technology is not just needed to collect, transport, treat and dispose of wastes. More importantly, these should be designed to give optimal benefits to the environment and to the people operating, using the technology.

There is a need to use technologies for source reduction, recycling and resource recovery. Recovery of recyclables from the dumpsite, for instance, should be done in safer, more sanitary conditions. Waste pickers are exposed to so many hazards and since they do this on their own, without government support, they receive no protection at all.

Upgrade of the landfill back into its sanitary design is needed and will be addressed by the ADB project. A system for diverting waste plastics, some 15 to 20% of the total waste, should also be installed for conversion to diesel fuel.

In line with this, social infrastructure should also be developed since there are about 300 or so waste pickers in Inayawan alone that would be affected by the upgrade. The system in the city would have to be developed also to rid of the ways by which scavengers can have access to wastes. After segregation at the source level, there should be separate collection schedule and collection trucks and separate destinations for recyclables and biodegradable materials, or there could be a transfer station of Central MRF where further segregation can be done.

To complement the major Inayawan project, barangays and communities should have access to small scale equipment for their own recycling activities.

10.6. Stakeholders

In actual practice, residents wait for the schedule of collection their area. They then take out their garbage. Out of sight, out of mind. Segregation at is practiced only at a certain level, but only because there are buyers (and beggars) of recyclables going around communities to gather waste plastics and glass bottles they can sell to small junkshops.

Collection crew usually do not check on the garbage they load if these are segregated, and if so, assign an area where a specific material should be placed inside the dump truck or compactor for that matter. But there is also a common practice where collection crews get as much saleable items as they can and place them inside sacks and *bakat* at the side of the truck. This becomes a part of the informal waste recovery system, since they sell these items on their own.

Commercial establishments and industries contract out hauling and disposal services. But often they have an MRF or a segregation area where saleable items are stored and sold to medium or major buyers.

Buyers on the other hand, operate mostly for trading outside. The bulk of the plastic waste being recovered is transported outside the province for recycling. Local recycling would add more value to these materials since transport costs will be reduced.

Given this set-up, a systematic overhaul is needed to define the roles of each stakeholder in SWM chain and shift the focus of attention from mere disposal to recovery and recycling.

More multi-sectoral information activities should be held, so as to inform other stakeholders of the entire waste management chain, and clarify that their day to day practices impact the system. Specific roles of each sector will then be delineated, and as needed, interface and overlaps defined.

10.7. Opportunities for waste plastic management

The main factor in waste plastic management is early recovery and diversion. Waste plastic already in the dump would require so much manpower and resources to recover and process. In formulating an improved and RA 9003-compliant waste management system in the city, the source, direction and destination of specific waste materials should be illuminated to stakeholders. Major generators such as commercial establishments and industries, as well as households, schools and offices should be enjoined to be part of the waste recovery system, so that the entire waste plastic resources will be gathered systematically and efficiently.

There are numerous waste plastic conversion technologies being used in worldwide. One of the most ecological means is to convert these wastes into diesel fuel. Apart from the major reduction in waste volume going to the dumpsite, it will also address the local government's fuel needs while at the same time helping reduce GHG emissions for displacing the use of petroleum-based fuels. It also addresses the cumbersome means by which plastic wastes are being recycled nowadays, that require extensive sorting, washing and drying. It will also eliminate concerns of workers' exposure to unsanitary conditions.

In preparing to install a plastic waste to fuels conversion facility, the local government can summon support and resources from various sectors: residents, the academe, NGOs, commercial and industrial entities, relevant national government agencies and international funding donors.

PBSP, whose members are commercial and industrial establishments in the city can represent the sector, and provide various assistance from waste plastic recovery in the sector, to provision of supplemental funds and resources. Kaabag sa Sugbtu, whose presence at the grassroots can be felt through the work of its numerous member organizations and network-led projects, can handle the CBWM component.

The LGU will have the pivotal role in implementing the project, since it will be the one to gather all stakeholders, provide direction and guidance and invoke applicable policies in the implementation of the project.

Various institutions offer financing opportunities for such projects: DENR as the DNA for CDM, government financing institutions such as DBP, corporate foundations and international donors already working in partnership with Cebu City in its various environmental initiatives

Enabling laws such RA 9003 and the Renewable Energy Act offer incentives for the installation of such projects. The LGU is more than willing to lead in its implementation with technical assistance from UNEP-DTIE-IETC.

With a plastic to fuels project in Cebu City, plastic waste will cease to be a menace to become an important resource that will benefit the city and its constituents.

11. APPENDICES

11.1. Laws, Regulations and Ordinances Related to Waste Plastic Management

Table 13. Laws, Regulations and Ordinances Related to Waste Plastic Management

NUMBER	TITLE	DATE ENACTED
	Basel Convention	
	United Nations Framework Convention on Climate Change (UNFCCC)	
	Japan-Philippines Economic Partnership Agreement (JPEPA)	September 9, 2006
	Philippine Constitution	1987
PD 825	Garbage Disposal Law	1975
PD 856	Sanitation Code of the Philippines	1975
PD 984	Pollution Control Decree	1976
PD 1151	Philippine Environmental Policy	1977
PD 1152	Philippine Environmental Code	1977
RA 7160	The Local Government Code	1991
RA 8749	The Clean Air Act	1999
RA 9003	Ecological Solid Waste Management Act	2000
RA 9275	Philippine Clean Water Act	2004
RA 6969	Hazardous Waste Act	1990
RA 9513	Renewable Energy Act	December 16, 2008
DAO 93-90		1993
DAO 98-49	Technical Guidelines for Municipal Solid Waste Disposal	1998
DAO 98-50	Adopting the Landfill site Identification and screening criteria for municipal solid waste disposal facilities	1998
DAO 92-29	Implementing Rules and Regulations of Republic Act 6969	1992
JAO 06-01	Adopting Environmental Technology Verification Protocol (ETVP)	2006
DAO 01-34	The Implementing Rules and Regulations of Republic Act 9003	2001
DAO 03-14	Philippine Environment Partnership Program (PEPP)	June 2, 2003
DAO 03-30	This order clarified the coverage of the Environmental Impact Statement (EIS)	August 4, 2003
DAO 06-10	Guidelines on the Categorized on Final Disposal Facilities (Sanitary Landfill)	2006
DAO 24-98	Interim Guidelines for the importation of recyclable materials containing hazardous substances	
RA 6957 as amended by RA 7718	The BOT Law	
NSWMC Resolution No. 2005-05, and DAO 2006-09	General Guidelines in the Closure and Rehabilitation of Open Dumpsites and Controlled Dump Facilities	
DAO 05-17	Rules and Regulations Governing the Implementation of EO 320 Series of 2004	2005
DAO 2005-06	Mandatory Environmental Insurance Coverage	2005
JAO 05-02	Establishing the proper guidelines and policies for the treatment, storage and disposal (TSD) of HCW	2005
RA 4226	Hospital Licensure Act	
E.O. 192	EMB mandated to conduct education and information services; provide research and laboratory services; and serve as secretariat in the adjudication of pollution cases.	

EO 774	Reorganizing the Presidential Task Force on Climate Change	December 26, 2008
	The Philippine Environment Partnership Program	
Cebu City Ordinance No. 2017	An Ordinance Creating the Cebu City Solid Waste Management Board (SWMB) and Appropriating Funds	October 6, 2004
Cebu City Ordinance No. 1361	An Ordinance Establishing a System of Garbage Collection, Imposing Fees Therefore, and Expropriating Funds and for Other Related Purposes	April 1, 1990
Cebu City Ordinance No. 2031	An Ordinance for the Implementation of Solid Waste Segregation at Source, Providing Penalties Thereof and the Creation of a Special Fund for incentives	November 10, 2004
House Bill 4134	Imposition of a P2.50 excise tax on every plastic bag	
Senate Bill 1443	Plastic Bag Recycling Act	
Proposed	The Local Environment Code of Cebu City	May 28, 2008

11.2. Resource Persons

OFFICE	NAME	DESIGNATION
Asia I.T. Park	Levi Lopez	Administrator
	Batiancila Noril	Asst. Administrator
Cebu Business Park Administration	Adonis Sencio	Administarator
Cebu Holdings Incorporation	Leo Cadiz	Asst. Bldg. Administrator
City Councilor	Hon. Edwin R. Jagmoc	Chairman on Committee on Public Services
	Hon. Augustus Pe	Deputy Mayor for the Landfill
	Hon. Nestor Archival	Chairman on Play
CPDO	Engr. Paul Villarete	Head
	Mariecon Encabo	Assistant
	Porlia A. Abugan	Eng'g Asst.
	Misty Magistrado	Personnel
DPS	Engr. Dionisio J. Gualiza	Chief of Garbage Collection Section
	Engr. Randy A. Navarro	Officer In-charge for Daytime Garbage Collection
	Engr. Rogelio Legazpi	Officer In-charge for Nighttime Garbage Collection
Gagmay'ng Kristohanong Katilingban Lihok-Pagtinabangay Multi-Purpose Cooperative (GKKLPMPC)	Cris Ditchon	Former President
Hon. Archival's Office	Vincent Mangle	Personnel
Kaabag sa Sugbu	Jacque dela Pena	Executive Director
Landfill	Engr. Eduardo Potot	Operation In-charge
Philippine Business for Social Progress (PBSP)	Ma. Luisa Largo	Project Officer
SM Prime Holdings	RJ Leduna	Public Relations Officer

11.3. Research Team

Project Head - Ms. Shiela R. Castillo-Tiangco
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