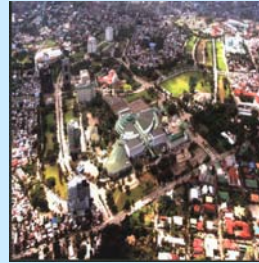


ENVIRONMENTAL MANAGEMENT IN CEBU CITY

Presented by:
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Cebu City, Philippines

Cebu today is...



- A bustling metropolitan area that serves as the center of trade and commerce in the Southern Philippines
- Known as the Queen City of the South, the city is also an international tourism center with complete facilities for international convention and trade fairs

Facts and Figures

- Located in the central part of the Philippines
- Land area of 326.10 square kilometers
- Population of 718,821 (the figure increases during day time due to workers coming from the neighboring cities and municipalities which are employed in the city)



Garbage Profile

- 500 grams- average waste generated by one person daily
- 450- 500 tons - average daily disposal of Cebu City
- Cebu City has 14-15 operational trucks complemented by 42 barangay owned trucks



Collection is done 24 hours and in three shifts.

Expenses and Garbage Fees

- Waste collection and disposal is highly subsidized
 - City only earns P7 million annually from garbage fees which is incorporated in the realty tax and business taxes and penalties for violation of garbage ordinance
 - it spends **P50 million- P70 million** to operate the Dept. of Public Services (DPS)



The DPS is the office tasked to collect garbage from the barangays. Its annual operation costs the City P50 to P70 million not including the expenses incurred by barangays who assist in the collection..

ENVIRONMENTAL PROGRAMS AND INITIATIVES

CESET

- Created through City Ordinance 2031
- Personnel charges are under Department of Public Services
- apprehends indiscriminate garbage throwers and City Ordinance violators

SOLID WASTE MANAGEMENT BOARD

- Created through Executive Order 00-33 last November 6, 2002 and through City Ordinance No. 2017 dated October 6, 2004
- The Board functions through 5 committees and an Executive Committee that manages the Board's day to day activities.

SWM Committees

- | | |
|---------------------------|---|
| • Information | • PIO, Office of Councilor Archival and Councilor Jagmoc |
| • SWM Plan | • City Planning, Dept. of Public Services, Dept. of Engineering and Public Works |
| • Resource Generation | • NGO, Local Finance Committee, Bantay Dagat, Market Operations Division, Office of Councilor Archival and Jagmoc |
| • SWM Plan Implementation | • DPS and CESET |
| • Monitoring | • City Health and NGO |

Acquisition of Shredder Machines

- Aimed at hastening the composting project
- utilizes 30 tons of market waste
- expected to produce 420 tons of bio - fertilizer
- machines stationed at the nursery and the landfill



Personnel operate the shredder stationed at the Nursery. Compost produced is given out to farmers for free to encourage organic farming.

Hospital Waste Segregation

- Hospital waste is now regularly collected by two dump trucks and are now dumped at a separate area in the landfill
- Segregation is now practiced in hospitals



Kwarta sa Basura has been launched in Vicente Sotto last Aug. 6, 2003. Women from KALIPI Foundation segregate trash and sell the recyclables materials.

Landfill Facility Improvement

- To improve landfill operations, the city has purchased additional soil cover and taken steps to modify the landfill area
- City intends to buy new weighing scales



The P208.7 million landfill in Barangay Inayawan was designed and financed by JICA. With a total area of 15.41 hectares, the landfill has been in operation since September 11, 1998

Biogas Digester



Personnel loading animal waste into the inlet of the 50 cubic meter biogas digester facility located at the City Nursery

- utilizes animal waste and converts it into usable gas
- P175,000 project was undertaken with the technical assistance of USC- ANEC
- facility has been operational since February 2002

Conduct of Seminars & Consultations

- Several seminars have been held to educate barangay leaders on waste segregation and RA 9003

- February 6-7, 2003
- March 14, 2003
- May 27-28, 2003
- March 19, 2004
- October 15, 2004
- Feb. 2-4, 2005
- March 6, 2005



The October 4, 2004 orientation gathered barangay captains and the Chairmen of the Brgy. Committee on Environment. It was a joint project of the Cebu City Government, IBP-NEAT and ABC.

Kwarta sa Basura Project

- Barangay-based segregation
- 26 barangays have been oriented
- residents gather recyclables and bring it to a collection site weekly for buying
- each resident has a passbook where earnings are recorded



Buying is usually done once a week. Residents are given a passbook where sales from trash are recorded.

Kwarta sa Basura Project

- funds managed by a cooperative
- earnings can't be withdrawn for the first 6 months
- A replication of the successful initiative of Brgy. Luz
- it seeks to minimize waste generation by encouraging residents to segregate, reuse and recycle



Before the project is launched, residents are oriented on how the project works. They are also educated on how to segregate trash and to set up a regular buying schedule for their barangay.

Seed Money for Barangays

- To set up an MRF in every barangay is not possible due to space constraints
- City will set-up weekly buying schedules for every barangay
- To encourage weekly buying of recyclables the City will give every barangay P10,000 as seed money
- Money will be managed by a group/cooperative chosen by the barangay which will be responsible for buying recyclables on a weekly basis

SWM Model Barangays

- DENR conducted a national search for SWM Model Brgy. to encourage LGUs to implement the SWM Act of 2000 or RA 9003
- Barangays Luz and Hiprodromo were among the top 181 barangays nationwide



The city is set to intensify its IEC campaign through the IEC Committee of the SWM Board, also with assistance of NGOs.

Composting

- Composting is done at the Landfill, Plaza Independencia and the City Nursery
- the project utilizes 2 tons of biodegradable waste
- it produces 350 kilos of organic fertilizer



African Nightcrawlers are used for the vermi-composting project at the City Nursery.

Haarlemmermeer has allotted 4,600 euros to cover the salaries for additional personnel to handle the composting project

Vermi-Composting

- The City Government ventured into vermi-composting
- African Nightcrawlers can be bought from the City Agriculture at P500 per kilo
- Vermicast will also be given out to farmers



Vermi culture is now practiced by some farmers in the upland barangays. In the photo is a demofarm in Sudlon II.

Garbage Fee Collection and Expenditures

- Cebu City charges a very minimal garbage fee which is incorporated in the Real Estate and Business Taxes
- Collection, transportation and disposal of refuse and garbage is highly subsidized by the City Government
- The City spends P47 million annually excluding costs of supervision, fuel, lubricants and aid to various barangays

Increase in Garbage Fees (thru City Ordinance 2018)

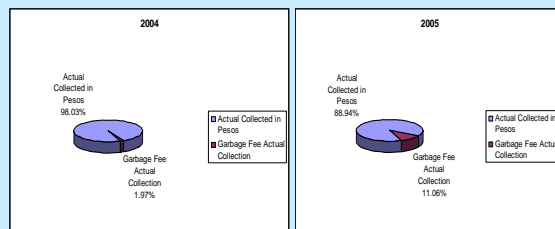
- Business establishments started paying increased garbage fees from January until December 2005 during renewal of business permit
- Minimum fee is set at P1.00 per day
- With the increase, the City is expected to generate P90 million which will go to a special fund which will be used EXCLUSIVELY for the expenses to be incurred by the Dept. of Public Services

Comparative Graph on Actual Tax Collection and Garbage Fee Collection

2004

2005

Garbage Fee Collection for 2004 compared to 2005 collection



Recent Activities

2007:

- Conduct of Solid Waste Characterization

Waste Characterization at the Landfill

Overview of Waste Sectors/Description

Commercial waste - Waste disposed by businesses and industries that is collected and transported by private and government haulers.

Residential waste - Waste disposed by households that is collected and transported by private and government haulers.

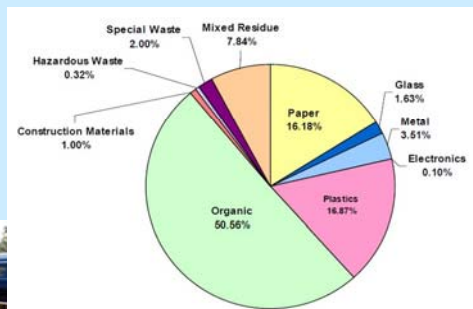
Markets Waste - generated from known public markets collected and transported by government haulers.

Institutions Waste - disposed by government agencies, schools and hospitals collected and transported by private and government haulers.



Waste Characterization at the Landfill

Composition of Cebu City's Overall Waste Stream



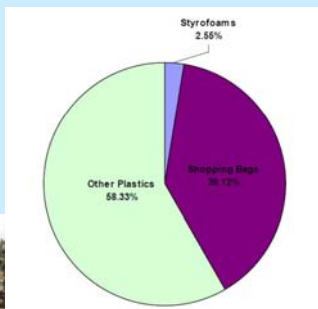
Waste Characterization at the Landfill

Composition of Cebu City's Overall Waste Stream

Waste Types	Estimated Percentage	+ / -
Paper	16.18%	0.02%
Glass	1.63%	0.00%
Metal	3.51%	0.01%
Electronics	0.10%	0.00%
Plastic	16.87%	0.02%
a. Styrofoam	0.43%	0.00%
b. Shopping Bags	6.60%	0.00%
c. Other Plastics	9.84%	0.01%
Organic	50.56%	0.03%
Construction Material	1.00%	0.01%
Hazardous Waste	0.32%	0.00%
Special Waste	2.00%	0.01%
Mixed Residue	7.84%	0.01%
Total	100.00%	
Sample Count	330	

Waste Characterization at the Landfill

Overview of the Composition of Plastics



Project Brief:

Converting Waste Plastics into Fuel

The United Nations Environmental Programme (UNEP) through the International Environmental Technology Centre (IETC), Division of Technology, Industry and Economics (DTIE) is implementing Integrated Solid Waste Management (ISWM) based on 3R (reduce, reuse and re-cycle). This also includes new waste streams such as waste plastics.

To build the local capacity and to support transfer technology, under Bali Strategic Plan, IETC has developed a project on "Converting Waste Plastics into a Resource" to build the local capacity on assessment of waste plastics and development of demonstration projects based on environmentally sound technologies and supportive policy framework.

Project Brief:

Converting Waste Plastics into Fuel

Overall Objectives:

1. To facilitate and support identification, assessment, and adaptation of technologies to convert waste plastics into diesel fuel thus leading to eventual transfer of technologies from developed to developing countries.
2. To raise awareness in developing countries on plastic waste and its possible reuse for conversion into diesel fuel and other applications.

Project Brief:

Converting Waste Plastics into Fuel

Overall Objectives:

1. To identify and assess technologies for other uses of waste plastic such as making roof tiles for low cost housing, making more weather resistant and long lasting roads etc.
2. Promote reuse of waste plastic thus providing alternative solutions to waste plastic disposal and simultaneous reduction in GHG emissions.

Project Brief:

Converting Waste Plastics into Fuel

To support the above objectives, IETC is currently developing:

1. Guidelines for assessment of waste plastics to develop baseline on characterization and quantification with future projections on waste plastics, and assessment of current waste plastics management system and practices
2. Compendium of technologies to convert waste plastics into fuel

Project Brief:

Converting Waste Plastics into Fuel

Project Activities:

1. Select 1 or 2 cities for baseline data collection and local capacity development and demonstration project
Time Frame: 1 week
2. Preparation of baseline report on waste plastics characterization and quantification with projection for future generation in the selected cities
Time Frame: 4 weeks
3. Training on waste assessment methodology
Time Frame: 3 weeks

Current Activities and Strategies:

Intensify collaboration with Non-Government Organizations

Pagtambayayong Foundation

- Pagtambayayong is one of the bigger Cebu-based NGO organized circa 1981 by a group of Community Organizers. Its mission is to organize and support urban poor organizations especially on housing and its related concerns. Its programs include self-help housing cooperatives, labor generation and appropriate technology

- Among its activities, Pagtambayayong promotes technologies that are environment friendly and labor intensive
- Since the mid 80's Pagtambayayong has been promoting compressed earth blocks. These blocks use much less cement and therefore energy compared with the more conventional concrete hollow blocks. It also uses the more commonly available limestone of Cebu rather than the more environmentally threatening sand.

- To promote this block Pagtambayayong maintains a Center for Alternative Technology and organized and supports Eco-Builders Multi-Purpose Cooperative that constructs and improves homes and neighborhoods.
- In Cebu, there are now private enterprises that also sell compressed earth blocks

- In addition, Pagtambayayong also promotes composting of biodegradable waste. Together with the City of Cebu, Pagtambayayong promotes composting using natural bacteria developed by Prof. Takakura and IGES, the City of Cebu and Pagtambayayong have encouraged thousands of families to practice household composting.
- Pagtambayayong has also prepared a project proposal to establish community based composting that will process 5 tons of garbage daily.

- Pagtambayayong has also organized Eco Dining that provides food catering services, specializing in food that is nutritious and environment friendly
- These and a few more, Pagtambayayong promotes in the belief that business and environment can indeed go together

Lihok Filipina

Since 2009, the City Government has linked wiith Lihok Pilipina for the clean up activities

Cebu City is taking to heart its responsibility to protect everyone's right to a balanced ecology.



Thank you very much!

