Kojima and Michida ed., *Economic Integration and Recycling in Asia: An Interim Report*, Chosakenkyu Hokokusho, Institute of Developing Economies, 2011

# Chapter 5

# Review of the Waste Management System in the Philippines: Initiatives to Promote Waste Segregation and Recycling through Good Governance

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**Abstract**

Like other developing countries, waste management has become a major problem in the Philippines for the past decades. This paper provides an overview of the waste management and recycling in the Philippines and the responses of the government to address various problems brought about by improper waste management. It reviews the policies related to waste management from 1938 to 2001, including the latest and perhaps the most comprehensive solid waste management policy in the country, the Philippines Republic Act 9003 (RA 9003). It presents the issues on the implementation of these policies, the status of compliance by the local government, and the recent initiatives and activities to promote proper waste management and recycling. Using the experiences of some selected case studies, it illustrates the potentials and benefits of recycling both in addressing the waste management problems and in alleviating poverty. This paper concludes that the application of good governance through participation of various stakeholders, strong awareness campaigns, and promotion and replication of innovative and appropriate technologies are necessary to achieve sound waste management and sustainable recycling industry.

***Keywords:*** Philippines, waste management, waste segregation, recycling

## Introduction

Inefficient waste collection and the lack of disposal facilities are the common problems in developing countries. Due to the lack of resources to purchase advanced and expensive technologies to support waste management activities, developing countries are more affected than developed countries. However, considering the characteristics of

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waste generated and the common condition in most developing countries, studies show that this type of technology may not always be a solution but instead this may only result to a greater financial debts and more environmental and health damage if not properly managed.

In most developing countries, the municipal solid waste stream is "dominated by organics." This means that the use of incineration is difficult, that the use of composting is necessary. There are also a huge number of people in the informal sector who are actively involved in waste collection, separation, and recycling. There is often a shortage of capital and human resource to manage the waste; and there is a lack of physical infrastructure in urban areas to make the waste collection more efficient, and therefore the situation calls for "low-tech" solutions (UNEP-IETC 1996). In the recent study of Scheinberg, Wilson and Rodic (2010), it also shows that the nature of waste varies depending on the income level of the country. According to their findings, high income countries have 29% organic waste while the lower-middle and low income countries have 67% and 71% organic waste respectively. For lower-middle income countries, other waste comprise of paper (8%), glass (2%), metal (1%), plastic (10%) (Scheinberg, Wilson and Rodic 2010 as cited in Wilson 2011). Given the differences on the characteristics of waste generated between high and low income countries, the needed technology may also be different.

In this paper, the discussion focuses on the Philippine setting. Like other developing countries, waste management has become a major problem in the Philippines for the past decades. The rapid population growth, urbanization and modernization in the country have resulted in the significant increase of waste generated especially in urban cities. This condition has created both environmental and health problems due to the inability of both local and national governments to implement proper waste management primarily because of scarce financial, human and technical resources. Also, "solid waste problems are not the only environmental problems, and environmental problems are certainly not the only issues competing for attention and funds" (UNEP-IETC 1996: 16). In addition, solid waste management is not "an isolated phenomena that can be easily compartmentalized and solved with innovative technology or engineering" (Srinivas 1998:1). There are also other issues that need to be considered such as the political, economic, technical and social aspects of environmental governance.

This paper provides an overview of the waste management and recycling in the Philippines. The first part presents the background about the Philippines and its waste

management system. It shows how several factors such as the rapid population growth, urbanization and modernization have contributed to the increased generation of waste particularly in urban cities; and how this condition has created various problems both to the environment and the human health. In addition, it also presents the responses of the government to address the problems brought about by improper waste management. It reviews the previous policies related to waste management and some probable reasons or factors that have contributed why it seemed that these laws have failed to address the various problems on waste.

The second part provides a detailed discussion of the latest and perhaps the most comprehensive solid waste management policy in the country, the Philippines Republic Act 9003 (RA 9003), known as the "Ecological Solid Waste Management Act of 2000." Also, this section presents the current status of compliance and the issues on its implementation.

After discussing the current situation of waste management in the country and the status of compliance by the local government, the third part focuses on the role of governance towards effective waste management implementation considering the characteristics of waste generated and the available resources. In addition, it presents the recent initiatives and activities to promote proper waste management and recycling. Using the experiences of some selected case studies, it illustrates the significance of participation of the various stakeholders, the promotion of the awareness and education campaigns, and the identification of appropriate technology based on the existing condition and available resources.

Given the potentials and benefits of recycling both in addressing waste management problems and in alleviating poverty, the fourth part deals on how to boost the recycling industry in the country. It presents some possible factors that affect the growth of the recycling industry such as the readiness of the community and other stakeholders; the political, technical, and social factors; the geographical, transportation and other factors such as the global crisis, among others.

The last part provides a conclusion on how the application of good governance through participation of various stakeholders, strong awareness campaigns and promotion and replication of innovative and appropriate technologies can promote sound waste management and sustainable recycling industry.

## 5.1 Philippines' Waste Management System

This part aims to provide a brief scenario about the Philippines, presents some of the factors that have contributed to the evolution of the waste management problems in the country, and the responses of the government to address this concern. It is important to know what has transpired prior to the problem so that the root cause can be identified and therefore the appropriate and possible solutions can be recommended based on the specific needs and the available resources at hand.

### *Philippines: Background*

The Philippines is an archipelago of 7,100 islands with a land area of 300,000 square kilometers. It is divided into three major geographical regions, Luzon, the Visayas, and Mindanao. It is composed of 17 regions, 81 provinces, 118 cities, 1,510 municipalities, and 41,995 barangays, the smallest political and administrative unit (Republic of the Philippines 2007). Based on the final results of the 2000 Family Income and Expenditure Survey (FIES), the number of families below the poverty line increased from 31.8% in 1997 to 33.7% in 2000 (or an increase of 1.9%) (NSO 2011). The Philippines has also one of the highest unemployment rates in Asia, 7.4% in October 2005 and 7.1% in October 2010 (Mangahas 2006; NSO 2011).

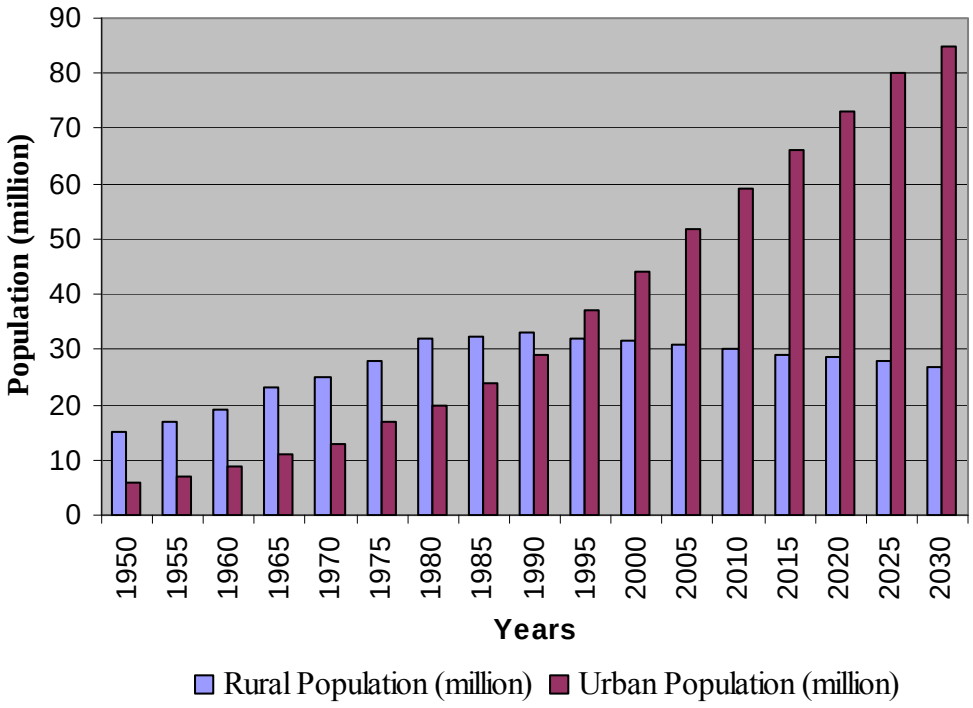
It is known to have one of the most active and most vocal civil society sectors in Asia. Based on the records of the Philippines Securities and Exchange Commission, in 1997 there were more than 58,000 registered sectoral organizations and maybe thousands more operating informally (Laquian 2005). The Department of Environment and Natural Resources (DENR) lists over 10,000 environmental NGOs and POs in the country (Magalona and Malayang 2001). It has been noticed that there has been an increased in the number of civil society organizations in many Asian countries and they have also strengthened their influence over environmental governance (Hopkinson 2001 as cited in Qadri 2001)."

### *Rapid Population Growth and Urbanization and its Impacts on Waste Management*

The country's population continues to increase in an accelerating rate and it is the "sixteenth most populous, out of more than 190 countries" (Magalona and Malayang 2001: 65). The Philippines` population exhibited a huge increase from 27 million in the 1960s to 88.57 million in 2007 (Espaldon and Baltazar 2004; NSO 2011). The annual population growth rate was 2.04 % for the period 2000-2007 (NSO 2011).

Aside from the increasing population, the rapid urbanization also contributes to the country`s problem of waste. Out of the country's population of 82.8 million in 2005, about 63% (51.8 million) lived in urban areas. In 2000, there were only 42 capital cities or urban agglomerations. However, it is estimated that there will be a 28% average growth of capital cities or urban agglomeration from the year 2005 to 2015. And by 2030, it is estimated that these urban population will reach 85 million or about 70% of the total population (Figure 1). About 20% of the country's urban population is below the national poverty line (UN Millenium Indicators Database 1997 as cited in Mangahas 2006).

Fig. 1. Trends in Urban and Rural Population, Philippines




Source: Mangahas, Joel V. 2006. "The Philippines," in Roberts, Brian and T. Kanaley, eds. Urbanization and Sustainability in Asia: Case Studies of Good Practice.

With this increasing population particularly in the urban areas, the amount of solid waste generated per day also increases. The unit generation rate of solid waste in the country ranges between 0.30 to 0.70kg per capita per day for rural and urban

communities respectively. As shown in Table 1, the National Capital Region (NCR) generates about a quarter of the country's total generation of waste.

As the population growth continues and given the stage in the socio-economic development in the country, it is estimated that the waste generation will also increase rapidly within the next few years (Table 1) (NSWMC 2005a).

Table 1. Estimated Solid Waste Generated in the Philippines

| | **2000** | | **2005** | | **2010** | |
|---|---|---|---|---|---|---|
| **Region** | **Tons/day** | **%** | **Tons/day** | **%** | **Tons/day** | **%** |
| **NCR** | 4,953 | 24.60 | 5,869 | 24.39 | 6,844 | 23.70 |
| CAR | 223 | 1.11 | 259 | 1.07 | 300 | 1.04 |
| Region I | 873 | 4.33 | 1,026 | 4.26 | 1,195 | 4.14 |
| Region II | 271 | 1.35 | 317 | 1.32 | 370 | 1.28 |
| Region III | 2,729 | 13.56 | 3,410 | 14.17 | 4,188 | 14.50 |
| Region IV | 3,935 | 19.55 | 5,126 | 21.30 | 6,582 | 22.79 |
| Region V | 654 | 3.25 | 754 | 3.13 | 851 | 2.95 |
| Region VI | 969 | 4.81 | 1,094 | 4.55 | 1,245 | 4.31 |
| Region VII | 1,607 | 7.98 | 1,962 | 8.15 | 2,354 | 8.15 |
| Region VIII | 336 | 1.67 | 384 | 1.60 | 430 | 1.49 |
| Region IX | 417 | 2.07 | 493 | 2.05 | 572 | 1.98 |
| Region X | 748 | 3.72 | 881 | 3.66 | 1,017 | 3.52 |
| Region XI | 986 | 4.90 | 1,190 | 4.94 | 1,407 | 4.87 |
| Region XII | 432 | 2.14 | 610 | 2.54 | 706 | 2.45 |
| ARMM | 253 | 1.26 | 325 | 1.35 | 409 | 1.42 |
| Caraga | 314 | 1.56 | 361 | 1.50 | 406 | 1.41 |
| ***PHILIPPINES*** | ***19,700*** | ***100*** | ***24,059*** | ***100*** | ***28,875*** | ***100*** |

Source: National Solid Waste Status Report, December 2004; National Solid Waste Management Framework, Pre-final Draft, March 2005 as cited in NSWMC 2005a, "Technical Guidelines on Solid Waste Disposal Design and Operation."

The lack of opportunities and extreme poverty in the countryside has forced the rural dwellers to seek better living in the urban areas. Infrastructure in the country is mostly focused on the NCR and this hinders the local and regional development. Due to unmanaged urbanization in Metro Manila (or the NCR) and other urban cities, the

country is facing a lot of problems such as pollution, inadequate water supply, high unemployment and crime rates, emergence of squatters, traffic congestion, and inefficient waste disposal (Mangahas 2006).

***Review of Policies Related to Solid Waste Management***

Considering the different social, economic and political issues besetting the country, addressing the gargantuan problem on waste is really a big challenge. This section describes the responses of the government to address various problems on waste management in the country. It reviews the different policies that are related to waste management from 1938 to 2001; and identifies some of the probable reasons why these previous policies seemed to fail to address the various problems on waste management.

Table 2 shows that in the past seven decades, the Philippine government has implemented several measures to protect the environment and the health of the people from the hazards caused by improper waste disposal. Even in the earlier regulations, the proper collection and disposal of wastes and the provision of penalties for non-compliance were emphasized. The policies also stressed the responsibilities of the LGUs in the effective implementation of solid waste management. Both PD No. 856, Code of Sanitation and PD 1152, Philippine Environmental Code required cities and municipalities to provide efficient collection, transportation and disposal of wastes. In the Local Government Code of 1991, the national government also devolved to local governments the provision of basic services including waste collection and disposal, consistent with the country's policy of decentralization (Ocenar 2001). Yet despite these opportunities given to LGUs to improve the lives of their constituents and to protect the environment by maximizing this devolved power, issues related to poverty persist and improved delivery of these services to the people remain a challenge (Philippines-Canada LGSP 2003). Thus, in spite of the presence of these policies, the problems of solid waste management have continued as before.

There are several factors that could have contributed to the failure of the previous policies to fully address the problems on waste management. While the intentions of these policies are good, it failed to get the cooperation of the community and various stakeholders because the laws were all "command and control" in nature. Another factor could be the archipelagic nature of the Philippines that have made the implementation of policies more difficult. The lack of infrastructure for efficient transportation especially in the provinces and inner areas of cities and barangays could have contributed in the inefficient implementation and ineffective monitoring of waste

management programs. In addition, the nature of politics or too much bureaucracy in the political system not only delays the implementation of rules and regulations but it also creates more opportunities for bribery and corruption along the way. In addition, since Philippines is a democratic country officials are elected by popular vote. Therefore officials seem to be afraid of apprehending violators because they are afraid that these people would be angry at them and would not vote for them during elections.

Table 2. Summary of Laws and Regulations Related to Solid Waste Management

| Year Enacted | Laws and Regulations |
|---|---|
| 1938 | Commonwealth Act No. 383 – Anti-Dumping Law<br>Prohibits dumping of refuse or substances of any kind into rivers. |
| 1975 | Presidential Decree No. 825 – Garbage Disposal Law<br>Provides penalties for improper disposal of garbage and other forms of uncleanliness. |
| 1975 | Presidential Decree No. 856 – Code of Sanitation<br>Requires cities and municipalities to provide an efficient collection, transportation and proper disposal of refuse in food establishments, markets and abattoirs. |
| 1976 | Presidential Decree No. 600, as amended by PD 979 – Marine Pollution Control Law of 1976<br>Prevents and controls the pollution of the seas by prohibiting dumping of waste and other matter that creates hazards to human health or harms living resources and marine life. |
| 1976 | Presidential Decree No. 984 – Pollution Control Law<br>Provides guidelines and implementing rules and regulations for the prevention and control of pollution from solid, toxic, and hazardous Wastes. |
| 1978 | Presidential Decree No. 1151 – Philippine Environmental Policy<br>Recognizes the right of the people to a healthy environment, and the duty of everyone to contribute to the preservation and enhancement of the environment. Section 4 requires the preparation of Environmental Impact Statements for any project or undertaking that May significantly affect the environment. |
| 1978 | Presidential Decree No. 1152 – Philippine Environmental Code |

| | |
|---|---|
| | Requires the preparation and implementation of waste management Programs by all provinces, cities and municipalities. |
| 1990 | Executive Order No. 432<br>Orders the strict implementation of PD 825 by all law enforcement agencies and officers. Enjoins the Metro Manila Development Authority to do for Metro Manila. |
| 1990 | Republic Act 6969- Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990<br>Regulates the importation, use, movement, treatment and disposal of toxic chemicals and hazardous and nuclear waste in the Philippines. |
| 1991 | Republic Act 7160 – The Local Government Code<br>Mandates LGUs to exercise powers and discharge functions and Responsibilities as necessary or appropriate and incidental to the efficient and effective provision of services and facilities related to general hygiene and sanitation, beautification, and solid waste collection and disposal systems. |
| 1998 | Department Administrative Order No. 98-49<br>Provides technical guidelines for proper disposal of municipal solid Waste |
| 1998 | Department Administrative Order No. 98-50<br>Provides procedures in identifying sanitary landfill site and screening Criteria for municipal solid waste disposal facilities. |
| 1999 | Republic Act 8749 – The Clean Air Act<br>Provides a comprehensive air pollution control policy and for other purposes. Section 20 bans the use of incineration for burning municipal, bio-medical, and hazardous waste but allows the traditional method of small-scale community burning. |
| 2001 | Republic Act 9003 – Ecological Solid Waste Management Act of 2000<br>Declares the policy of the state to adopt a systematic, comprehensive, and ecological solid waste management program. |

Sources: World Bank. 2001. Philippines Environment Monitor 2001; NSWMC. 2005a. Technical Guidebook on Solid Waste Disposal Design and Operation; Lapid. 2007. "National Reports: Philippines," in Environment Management Centre, Mumbai, India, eds. Solid Waste Management in Asia: Issues and Challenges in Asia.

The next part provides the detailed discussion of the Philippines RA 9003, also known as the Ecological Solid Waste Management Act of 2000. It is the most recent and considered to be the most comprehensive law on solid waste management in the country. Although the earlier policies were not successful and some of these laws have been superseded with the enactment of the RA 9003, they still contain provisions that are relevant in the planning and implementation of the Act (NSWMC 2005a). In addition, this part presents the status and issues of its implementation.

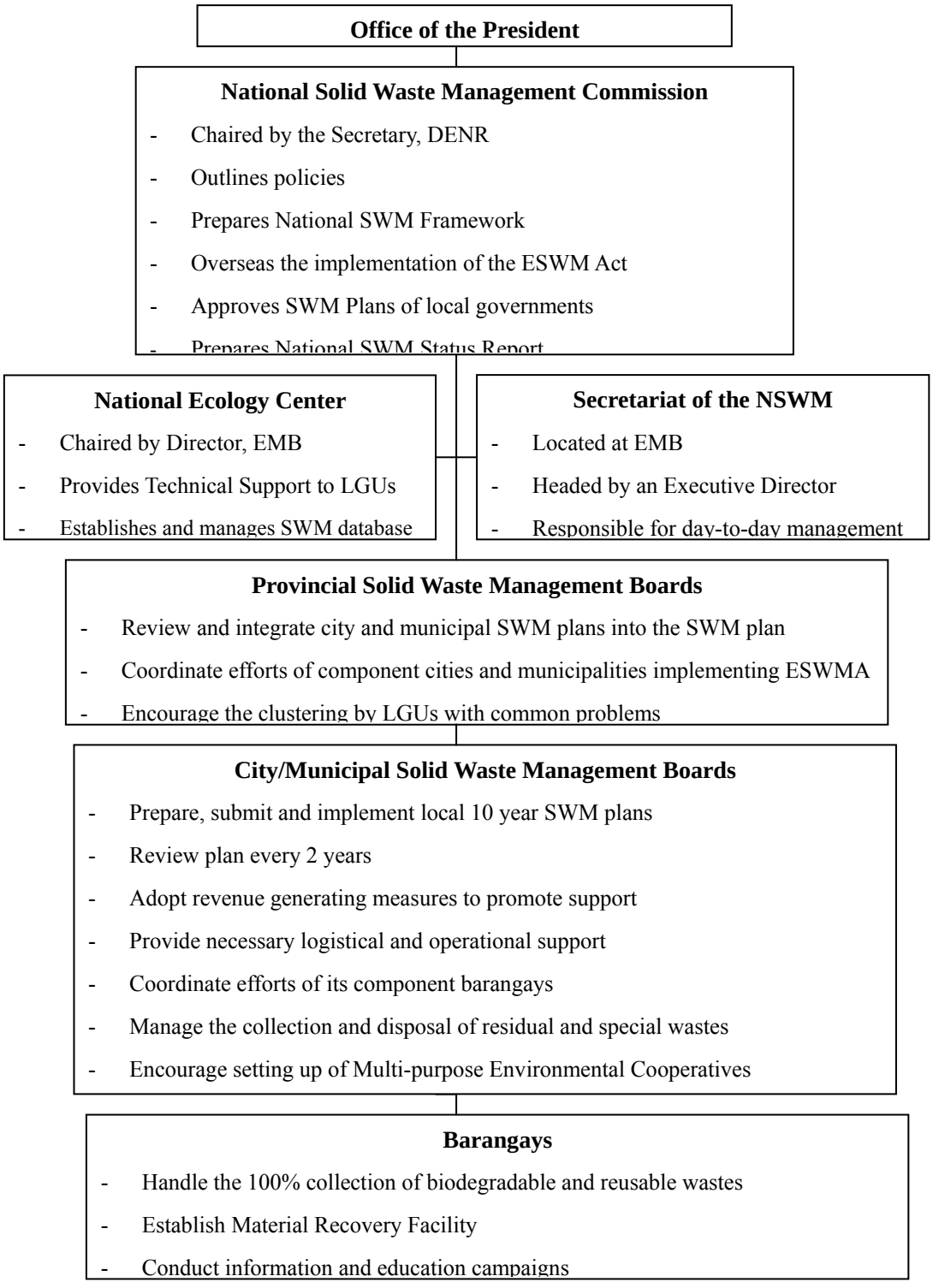
## 5.2 The Implementation of the Philippines Republic Act 9003, also known as the Ecological Solid Waste Management Act (ESWMA) of 2000

### *The Legal Framework*

In response to the critical condition of solid waste management problem and the threat it poses to the environment and human health if it remains unsolved, the Philippine government enacted the Republic Act 9003 on January 26, 2001. Unlike previous environmental policies that used a piecemeal approach, the Ecological Solid Waste Management Act of 2000 takes a holistic approach to the problems of solid waste management. It declares the intention of the state to adopt a systematic, comprehensive and ecological solid waste management program that will ensure the protection of public health and environment (Republic of the Philippines, RA 9003, Article 1, Section 2).

The organizational structure of the institutions and organizations and their responsibilities as mandated in RA 9003 is shown in Figure 2. The National Solid Waste Management Commission (NSWMC) was created under the Office of the President, primarily to prescribe policies to attain the objectives of the Act and to oversee the overall implementation of the solid waste management programs. The NSWMC is chaired by the Secretary of DENR with members from 14 government sectors and three members from the private sector. The private sector includes representatives from NGOs, the recycling industry, and from the manufacturing and packaging industries (Republic of the Philippines, RA 9003).

Fig. 2. Institutional Arrangements Mandated by the ESWMA




Source: World Bank. 2001. Philippines Environment Monitor 2001

***Salient Features of the RA 9003***

The primary role of the LGUs in the implementation. Pursuant to the Philippine Local Government Code, it is mandated in RA 9003 that the LGUs will be the primary responsible units in the implementation of the Act (Section 10). They are given the task of establishing provincial and city/municipal solid waste management boards and preparing a 10-year solid waste management plan for their community (Sections 11, 12, and 16).

The mandatory closure of all dumpsites. RA 9003 prohibits the operation and establishment of open dumpsites upon the coming into force of the Act. It further states that all open dumpsites should be converted into controlled dumpsites after three years, and that all controlled dumpsites should be closed within five years of the implementation of the Act (Section 37). The DENR and NSWMC provided guidelines for the safe closure and rehabilitation of open and controlled dump facilities (DENR 2006a and NSWMC 2005b).

As an alternative, the construction of sanitary landfill (SLF) is allowed as a final disposal site for residual wastes but it should be in accordance to the criteria provided by the Act (Sections 40, 41, and 42). The DENR and the NSWMC provided guidelines on the categorization of final disposal facilities (DENR 2006b and NSWMC 2005c) based on the potential net residual solid waste generation of the municipality, and also the environmental, socio-economic and hydro-geological characteristics of the area.

The mandatory 25% waste diversion. The LGUs are also mandated to divert 25% of their generated waste within five years after the implementation of the Act through composting, re-use and recycling activities. It further states that the reduction should be increased every three years (Section 20). Thus, the Act also mandates a segregation of solid waste at source (Section 21) and the creation of MRF in every barangay or cluster of barangays (Section 32). The barangay is responsible for the collection of the segregated biodegradable and recyclable wastes while the city or municipality is responsible for the collection of non-recyclable and special wastes (Section 10).

Participation of all sectors. Although the LGUs are the primary responsible in the implementation of the Act, the participation of the private sector and the community is also encouraged (Section 5q). The Act also mandates that the Solid Waste Management Board in every province, city or municipality should have a representative from the NGO sector, recycling industry, and manufacturing or packaging industries (Sections 11, 12). Sections 29 and 30 prohibit the use of non-environmentally

acceptable products and packaging within a year of the Act coming into force, except for those used in hospital, nursing homes or medical facilities, or those which there is no commercially available alternatives as identified by the NSWMC.

To encourage greater participation by the citizens, the Act allows anyone to file a civil, criminal or administrative action against any individual, institution or agency, or against government officials who violate or fail to comply with the law (Section 52). The NSWMC in coordination with other concerned government agencies, NGOs and private institutions is also mandated to promote continuing education and information campaigns to develop public awareness about solid waste management (Section 55). The integration of environmental concerns in school curricula at all levels should also be strengthened (Section 56).

Incentives and Penalties. The Act provides incentives to any individuals, private organizations, NGOs, and LGUs to contribute to the implementation of the solid waste management programs (Section 45). On the other hand, a set of fines and penalties are also provided for any individuals and corporations who have violated the regulations of the Act (Section 49). Administrative sanctions are also included for local government officials and officials of government agencies who have failed to enforce the rules and regulations in the Act (Section 50).

Funds. A special account has been created in the National Treasury as a Solid Waste Management Fund, to be financed from fines and penalties, issuance of permits and licences, donations, grants and contributions from domestic and foreign sources. The fund will be used to finance different solid waste management programs, to give awards and incentives, and to support other activities in promoting the effective implementation of the Act. LGUs are entitled to avail themselves of the funds based on the approved solid waste management plan (Section 46). In addition, LGUs are authorized to collect solid waste management fees (Section 47).

***RA 9003: Current Status of Compliance and Issues on its Implementation***

The RA 9003 is considered as the most comprehensive solid waste management Act in the Philippines and it seems to be a big step forward in addressing the solid waste management problems in the country. The Act takes a holistic approach in dealing with the problem and it acknowledges the importance of the participation of all sectors for its effective implementation. However, the records of the NSWMC show that the implementation of the Act is behind schedule. It has been ten years already since the enactment of the RA 9003 in 2001, but there are still a lot of open and controlled

dumpsites that continue operating and only few SLFs have been established as mandated in the Act (Table 3). Also, as of the third quarter of 2010, there are only 6,597 MRFs in the country serving 7,938 barangays (out of about 42,000 barangays in the country) (NSWMC 2011).

Table 3. Inventory of Disposal Facilities (As of third quarter of 2010)

| Region | Open Dumpsite | Controlled Disposal Facilities | Land-fill | SLF w ECC Undergoing Construction | ATC Issued | SCRP | MRF | MRF Served |
|---|---|---|---|---|---|---|---|---|
| 1 | 74 | 37 | 2 | 5 | 35 | 76 | 434 | 456 |
| 2 | 33 | 26 | 2 | 16 | 46 | 51 | 156 | 161 |
| 3 | 92 | 17 | 5 | 3 | 54 | 70 | 291 | 340 |
| 4a | 53 | 59 | 7 | 3 | 55 | 64 | 648 | 773 |
| 4b | 44 | 22 | 2 | 1 | 26 | 31 | 115 | 120 |
| 5 | 74 | 7 | | 1 | 54 | 56 | 292 | 376 |
| 6 | 97 | 18 | 3 | 4 | 66 | 79 | 640 | 800 |
| 7 | 116 | 50 | 6 | 1 | 8 | 22 | 390 | 424 |
| 8 | 69 | 11 | 1 | 7 | 40 | 48 | 875 | 1057 |
| 9 | 29 | 27 | | | 20 | 30 | 248 | 283 |
| 10 | 36 | 40 | | 1 | 12 | 14 | 436 | 616 |
| 11 | 1 | 27 | | 1 | 26 | 35 | 607 | 607 |
| 12 | 14 | 32 | 2 | 1 | 39 | 45 | 175 | 184 |
| 13 | 43 | 7 | | 2 | 46 | 55 | 548 | 590 |
| CAR | 15 | 0 | 1 | 2 | 3 | 4 | 154 | 182 |
| NCR | | | 1 | | 4 | 4 | 933 | 954 |
| ARMM | | | 1 | | 1 | 1 | 15 | 15 |
| **TOTAL** | **790** | **382** | **33** | **48** | **535** | **685** | **6597** | **7938** |

Source: NSWMC. 2011.

Notes: SLF- sanitary landfill; ECC –environmental compliance certificate; ATC –authority to close; SCRP –safe closure and rehabilitation plan; MRF- material recovery facility; CAR –Cordillera Administrative Region; NCR –National Capital Region (or MM –Metro Manila); ARMM –Autonomous Region in Muslim Mindanao)

Thus, although RA 9003 seems to be a very comprehensive act in addressing solid waste management in the country, records show that there is a weak compliance in the law and there are still a lot of issues and concerns that need to be addressed. These include the following: technical and policy issues, financial constraints and the NIMBY syndrome, setting of unrealistic deadlines, and other institutional issues such as the political will and terms of office of the local officials, the non-mandatory or non-permanent position of the Municipal Environment and Natural Resources Officers (MENRO), and an inefficient or slow judiciary system.

Technical and policy issues. The Act imposes enormous responsibilities on the LGUs but it provides little support for the LGUs to effectively comply with what the law requires. It is a fact that most of the local officials are not so familiar with solid waste management or technically competent to deal with it. It seems that LGUs have been given a lot of things to do but the law has no provisions to enable them to carry out those duties and responsibilities. According to the study by Serrano (2005), the LGUs are the main implementers and the bodies most affected by the Act and yet, with the exception of the Metro Manila Development Authority (MMDA), they were not present during the passage of the Solid Waste Management bill (Serrano 2005).

Financial constraints and the NIMBY syndrome. With all the tasks expected of the LGUs such as the construction of SLFs as an alternative disposal sites for residual waste, the establishment of MRFs in every barangay, and conduct of other solid waste management activities, the local officials are daunted by the huge amount of work needed to comply with the law. It is estimated that a landfill would cost about P20 million a hectare (Ibid.). But the national government does not provide sufficient funds to finance these activities. This was confirmed by some of the mayors during the Solid Waste Management Association of the Philippines (SWAPP) Conference held in Manila last November 2010. The local government officials/mayors complained that they only received a lot of "tasks to do" but no support from the national government on how to carry out those tasks. Although, the Act allows the LGUs to collect fees for solid waste management services, they are still not enough, especially for lower class municipalities. It is also observed that successful technologies and approaches are not well disseminated nationwide for possible replication.

To address the financial issues concerning the establishment of SLFs and to consider the characteristics and capability of each municipality, the DENR provided different categories of SLF through the DENR Administrative Order No. 10, September

2006. The categories of SLFs are based on the net residual waste generated by the municipality, which means the amount of waste generated after subtracting the amount of waste diverted through composting, recycling and other methods of recovery, from the total potential waste generated by the LGU. It also considers the projected increase of waste generation over a 10-year period.

However, although the construction of the sanitary landfill is promoted as an alternative final disposal facility, finding sites has been difficult, primarily due to factors such as the social acceptability issues and the not-in-my-backyard (NIMBY) syndrome. Although, the NSWMC and DENR provided guidelines for the safe establishment and operation of landfills, many communities are still afraid of the environmental and health hazards due to leachates that contaminate grounds and surface waters. There are also some environmental NGOs that strongly opposed the establishment of SLFs. Another important concern is the big number of waste scavengers in the dumpsites who are depending on waste for livelihood, thus closing of dumpsites also means removal of their source on income. In Payatas alone, there are about 2,000 waste scavengers in the previously open dumpsite.

Setting of unrealistic deadlines. Aside from the limited technical and financial support from the national government, the law also provides an insufficient amount of time to close all open and controlled dumpsites (Philippines-Canada LGSP 2003). The law states that there should be no dumpsites after five years from the coming into force of the Act, or by the year 2006. Thus, at this present time supposedly there should be no dumpsites operating anymore. However, it seems that the law sets unrealistic deadlines because there are a lot of technical, financial, environmental, health and other issues that need to be considered for safe and proper closure of dumpsites and for constructing sanitary landfills. Even the NSWMC and DENR that were required by the law to provide the guidelines for the closure and rehabilitation of disposal facilities were also behind schedule because the guidelines were only approved in 2005 (NSWMC 2005b) and 2006 (DENR 2006a), but the deadline for closure was 2006.

Other institutional issues. There are also other institutional issues that hamper the effective implementation of the Act such as the political will and terms of office of the local officials, the non-mandatory position of the Municipal Environment and Natural Resources Officer (MENRO), among others.

Being the main implementers of the Act, the local officials can either make the programs succeed or fail based on how they carry out their duties and responsibilities. But sad to say, despite the intensive IEC campaign and hard work by the NGOs to

promote solid waste management programs, most of these officials are not so enthusiastic about implementing the Act. Without the support of the local officials, programs such as the Ecological Solid Waste Management Act will not go any further than the existing method of mixed collection and open dumping of wastes (Sapuay 2005).

Also, even though the local officials have the initiative and are cooperating in implementing the Act, their short term of office affects the continuity of the programs. A mayor has only a three-year period of office and can be re-elected up to maximum of three consecutive terms (Republic of the Philippines, RA 7160, Section 43). But the problem occurs when the mayor is not re-elected and the succeeding officials have a different agenda (Sapuay 2005). Thus, with all the solid waste management tasks and other concerns of the mayors for his constituents, a three-year period is not enough to make the solid waste management programs sustainable, especially when there is change of leadership.

Another critical issue in the success of the program is the nature of the MENRO's position. Most of the LGUs do not have a permanent MENRO because unlike municipal engineers and health officers, the MENRO is not a mandatory position. Although most of the LGUs would like to appoint a MENRO, they cannot do it because of the municipal's limited budget. Thus, most of the MENRO are other officials who have been designated as MENRO, which means that solid waste management is just work added to what they are actually doing. This condition affects the effective functioning of the MENRO, which also results in weak implementation of the solid waste management programs in the municipality.

However, although there are still some issues and concerns that need to be solved, generally the enactment of the RA 9003 can still be considered as a positive development to address the perennial problems of solid waste management in the country. Thus, it is worth to study how this Act can be properly implemented despite some "loopholes that need to be mended, provisions that need to be reviewed and revised" (Sapuay 2005: 57). In the succeeding part, the significant role of governance towards effective and sustainable waste management, the promotion of awareness campaigns and the inclusion of market–based policy instruments to encourage participation will be discussed.

## 5.3 The Role of Governance Towards Effective Waste Management Implementation

As mentioned earlier, addressing perennial problems like solid waste management, identifying the root cause of the problem and the available resources in terms of finances, human and technical aspect are important in determining the possible solutions and strategies. It is illogical to design a so-called "perfect technical system or set of policies if they cannot be implemented." By careful consideration of the available resources and the constraints, we can avoid the common mistake of "determining what should be, and instead concentrate on what is possible" (UNEP-IETC 1996: 16).

This part presents the significance of applying good governance in dealing with various waste management problems and at the same time contributing for poverty alleviation. In addition, it identifies the possible and appropriate technologies based on the characteristics of waste generated and the available resources. Also, it presents the recent initiatives and approaches on how to promote participation towards sustainable waste management and recycling.

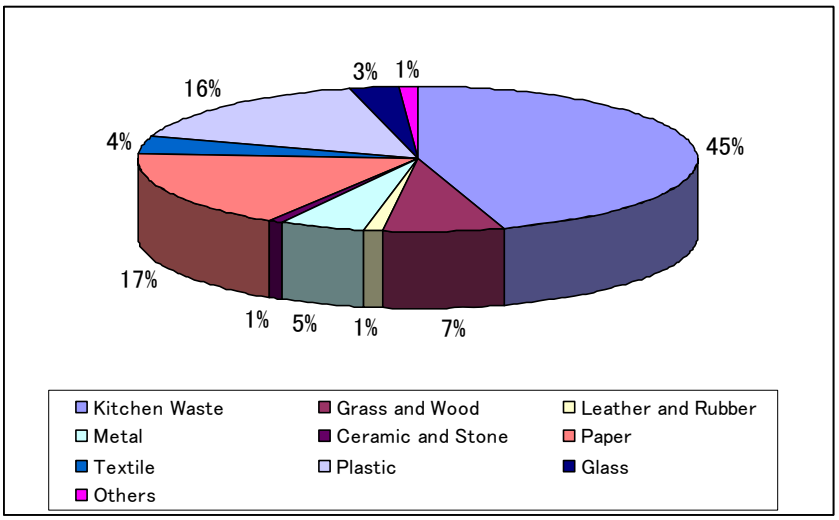
***Composition and Sources of Waste***

Based on the previous discussions, it proves that waste management problems have continued to exist despite the creation of various policies because it failed to address the root cause of the problem which is the disposal behavior of the generators. Also, it shows that considering the characteristics of waste generated and the huge number of informal recyclers, the construction of expensive technologies like SLF may not always be necessary. Instead, the promotion of waste segregation at source and the use of simple, cheaper and appropriate technology to promote recycling should be strictly enforced through participation and strong awareness campaigns.

Research shows that the higher percentage of waste generated in the Philippines is made up of organics and recyclable waste. To cite for example, in Metro Manila, Figure 3 shows that the greater percentage of waste generated are biodegradable and recyclable waste. In addition, Figure 4 shows that 74.14% of these wastes come from households and 16.9% comes from commercial establishments. This means that if only households and commercial establishments could segregate waste properly and practice recycling; only a very little amount of waste would be dumped in the disposal sites. This would be because kitchen waste can be turned into compost and the recyclables can be stored in the barangay's MRF for marketing or can be used as raw materials in the production of recyclable products. In this way, it would not only reduce the volume of waste to be dumped in disposal sites but it would also save a large amount of money in

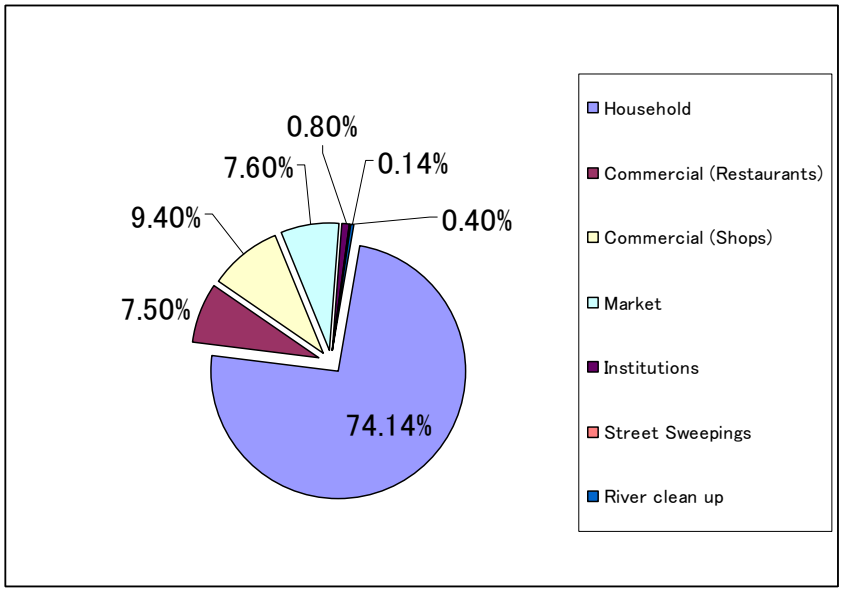
the hauling services and at the same time it would create an additional source of income for the barangays and communities as well.

Fig. 3. Waste Composition in Metro Manila




Source: MMDA. 2007. Door-to-Door Garbage Collection in Metro Manila.

Fig. 4. Sources of Waste in Metro Manila




Source: Ibid.

Considering the type of waste generated in the country and the existing

conditions and available resources, it seems that the use of low-cost and low-tech technology through composting, re-use, and recycling is more effective in addressing the problems on waste. This approach does not only reduce the volume of waste generated but also it offers more income opportunities, which means that it is also related to poverty reduction. This kind of solid waste management strategy is seen to be more sustainable as it is simple, cheap, and at the same time environmentally and socially acceptable. Another salient feature in the situation in Philippines is the huge number of environmental NGOs who are actively involved in promoting waste conservation and environmental protection programs including waste management. In the succeeding part, the significance of environmental governance to encourage participation of various stakeholders will be discussed.

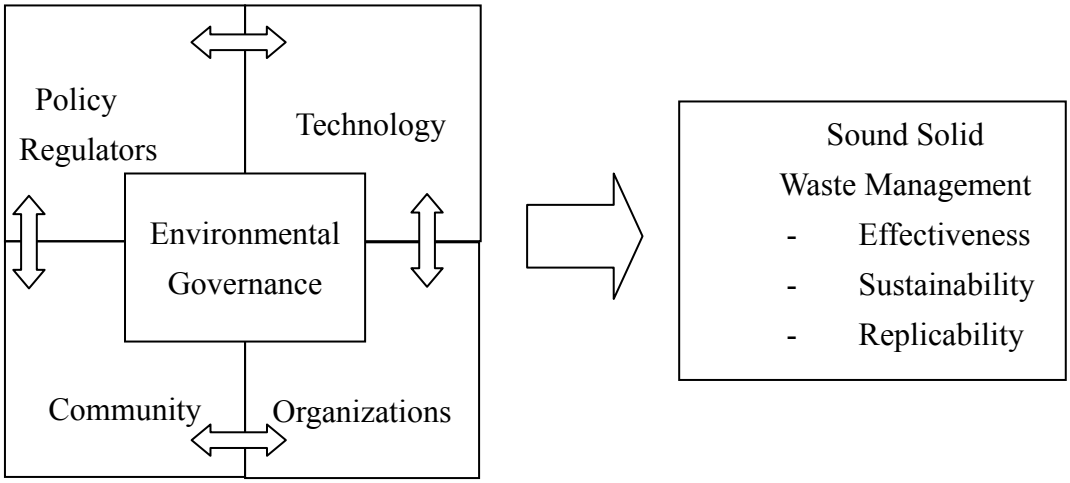
***Environmental Governance towards Sustainable Waste Management***

In this study, environmental governance refers to the processes and mechanisms that integrate the different elements of solid waste management such as the policy regulators, the different organizations, the community, and the required technology towards the implementation of a sound solid waste management in developing countries, particularly in the Philippines (Figure 5) (Atienza, 2009). The elements of good governance include transparency (availability of information such as the ordinances, rules and regulations through IEC), participation, and accountability (or the sense of responsibility or ownership) by the various stakeholders and their conscious efforts to contribute in solving the problems. The attributes of sound solid waste management includes effectiveness, sustainability and replicability.

Policy regulators, which include the national government and LGUs play a very important role as leaders and law enforcers of the waste management programs. Organizations on the other hand, refers to other stakeholders which includes NGOs, people's organizations, business sector and other public and private organizations (research institutes, schools and universities). The community or the local people (households) are also an important stakeholder in the implementation of the waste management programs. The participation or non-participation of these sectors significantly affects the success of these programs. In addition, the identification of appropriate technology based on the existing condition and available resources is important in addressing the problems on solid waste management in the country. Technology is classified into two types: "hardware" (equipment, facilities, systems, etc.)

and "software" (waste minimization, users fee, manpower development, information dissemination, etc.) (Ogawa 1989: 72 as cited in Ocenar 2001: 4).

Fig. 5. Environmental Governance Towards Sound Solid Waste Management




Source: Atienza, 2009.

***Initiatives to Promote Proper Waste Management and Recycling: Some Successful Cases***

As discussed earlier, the extent of the problems on waste in the Philippines is beyond the capability of the government alone. In RA 9003, although the main implementers are LGUs, it also encourages the participation of other stakeholders such as the LGUs, NGOs, religious organizations, the private sector and the local communities. However, Zwiep and Dusk (1996) listed three conditions for public participation, which include the following: the "access to information; the say in the decision process; and the legal or administrative remedy to enforce access to information and public participation, and enforce substantive rights" (Zwiep and Dusk 1996). Thus, another important initiative is the promotion of strong information, education and communication (IEC) campaigns through flyers, house-to-house campaigns, information campaign parade, among others to encourage participation among various stakeholders. Also, a positive transformation in the attitudes and perceptions of the people towards proper solid waste management is possible through information dissemination not only about the hazards and risks of improper waste

disposal but at the same time the sharing of knowledge about the advantages and benefits of applying proper waste segregation and disposal methods (Atienza 2009). With the limited financial and technical resources, the use of local and low-cost technologies is also being promoted. Since these technologies are simpler and cheaper, it is easier and more sustainable. To encourage the participation of the barangays, cities and municipalities, the DENR also launched the "National Search for the Model Cities and Barangay" in eco-waste management. Cash and presidential trophies are given to recipients of the awards. To cite examples of successful cases from these initiatives, the experiences of some selected cities and barangays will be discussed in the succeeding paragraphs.

In Atienza (2008) i, the author discussed the experiences of the Municipality of Los Baños, Laguna and of Barangay Bagumbuhay, Quezon City on how they were able to achieve breakthroughs in waste management through participation, IEC campaigns and the use of low-cost and local technologies. Both of them were awarded as one of the model municipalities and barangays in the Philippines. In Los Baños, Laguna, the two major breakthroughs include the conversion of the open dumpsite into ecological waste processing center (also considered by DENR as an MRF) and the formation of the of the informal sector into organization (known as the Los Baños Solid Waste Organization or LB-SWO). The EWPC/MRF was inaugurated on June 14, 2004 and the LB-SWO was also formed in the same year and has been recognized as the official collectors of recyclable waste in the municipality. This has become possible through participatory decision-making, multi-sector dialogues, community mobilization through volunteer enforcers, and strong IEC campaigns. The municipality also strictly enforced the "no segregation, no collection" policy, recycling of biodegradables through composting (organic compost used as fertilizers for vegetables, fruits and flowers), and proper managing of recyclables. With the implementation of waste segregation and collection, there was a significant reduction of waste generated from about 33-35 tons of solid waste per day (Perez, 2006) when they were still practicing mixed collection to about 2 tons of biodegrables per day and about 8 tons of residual wastes collected by the municipal trucks every Saturday (Pantua 2008 as cited in Atienza 2008).

The Barangay Bagumbuhay, on the other hand has achieved breakthroughs in waste management through their "Basura Mo, Ipalit Mo" (Waste-for-Goods Exchange) Program, wherein residents could gain points when they gave their recyclables and then they could exchange these points for some items such as rice, medicines, soaps, shampoo, etc. With the use of simple and low cost technology, one of the innovative

strategies by the barangay is making paving tiles from recycled waste (mainly plastics). The barangay also managed their biodegrables through composting. Through these activities, the barangay was able to divert 65% of their waste from the dump and in just three years they were able to reduce the number of collection trips from 10 to 1.5 trips in one week. Thus, they received an incentive rebateii from the City Government amounting to P1.2 million cash in 2006 and they used it for a continuous operation of the program. In addition, they can extra income by selling compost at P5 per kilo and the kitchen waste to a piggery. The eco-police or the collectors of waste also earned extra income because profits from compost and recyclables are divided 50-50 between the barangay and eco-police (Atienza 2008).

To cite an example of the significant roles of NGOs, the experience of the Mother Earth Foundation (MEF) will be discussed. It has been recognized as the foremost NGO proponent of ecological solid waste management in the Philippines. The MEF was at the forefront in lobbying for the RA 9003 and the organization became instrumental in pushing for the use of the word "ecological" instead of "integrated" in the title and description of the legislation. This NGO also promotes zero waste management, which refers to the fast recovery of waste through recycling, reusing, and composting. It also advocates a bottom-up approach and the use of low-tech and low-cost solid waste management. Among the activities of this NGO are organizing seminars, setting up material recovery facilities, and promoting economic uses of recyclable waste. Its seminars include lectures on what it terms "inner ecology" (environmental ethics) and "outer ecology" (hands-on waste recovery) (Ancheta 2004).

The Caloocan City, second biggest city in the Metro Manila region (next to Quezon City), is one of the cities that received trainings from MEF. In collaboration with the LGUs and other sectors, MEF conducted a series of seminar-workshops on ecological solid waste management to increase awareness of RA 9003 and assisted the barangays in the construction and operation of MRFs to promote zero waste management. The General Assembly also meets every month wherein the Mayor, the MEF and all the chairmen from the 188 barangays gather together to discuss different issues and concerns in the implementation of the solid waste management programs. Barangay Solid Waste Management Committees (BSWMC) composed of representatives from various organizations like the religious sector, junkshops, schools, and others, were also created in every barangay. The "no segregation, no collection" campaign was also implemented in the whole city. It was reported that as of June 31, 2007, all the 188 barangays were able to create BSWMC. Also, Caloocan City was able

to establish 179 MRFs in 188 barangays, or a total compliance of 95.21% (Caloocan City Report n.d.). Through the collaborative efforts of the Mother Earth Foundation, the LGU of Caloocan City and the community, there was an effective operation of the MRFs in every barangay and there was about 11% reduction in the garbage being hauled compared to the previous volume of waste without the MRF (Ancheta 2004). This condition also means lesser amounts paid for hauling services and also reduced hazardous effects on the environment.

Another example that shows how establishment of simple facility like MRF could reduce the need for or could lengthen the lifespan of an expensive technology like SLF, the experience of Puerto Princesa, Palawan will be discussed. Puerto Princesa City is a Hall of Fame awardee for being the Cleanest and Greenest City in three years. In 1999, even before the RA 9003 came into force, they conducted hearings for the establishment of SLF, the first SLF in the Philippines. With about P200 million loans from the Asian Development Bank, the first phase of 2.7 ha was established in August 25, 2005. With the assumption based on 100 tons average waste collection at that time, the life span of SLF was 3 years and 2 months. But until now, they only used half (2 out of 4 cells). This is because the collection of residuals was reduced from 100 tons daily in 2005 to 48 tons daily at present with the implementation of waste segregation in every barangay.

The strict implementation of the waste management particularly the construction of MRF started in 2007. The local government of Puerto Princesa tapped the expertise of MEF to conduct trainings to every barangays in the city. Out of 66 barangays in the city, 31 are rural and 35 are urban barangays; 6 % of the total area is urban but 80% of its population lives there. For rural areas wherein houses are far from each other, small MRF is constructed per household; but for urban areas, MRF is constructed in each barangay. At present, only about 3-6 barangays (out of 66 barangays) are not complying with the program. Aside from recognition to model barangays, one of the effective strategies used is the "shame campaign" program wherein violators are broadcasted in local media.

Other recent initiatives in the Philippines include the recognition of the informal waste sector, the launching of the recycling collection events (RCEs) and waste markets, among others. In the National Framework Plan for the Informal Waste Sector in Solid Waste Management formulated in 2009, some of the proposed interventions include forming the informal sector into organization or cooperatives, capacity development, access to resources, etc. (NSWMC 2009). Atienza (2010)

presented some successful cases on how the condition of the informal waste sector was improved by forming them into organization and cooperatives and by upgrading their material recovery processes. One of the cases discussed by the author is the experience of the KILUS Foundation Multi-purpose Cooperative of Barangay Ugong, Pasig City. Their experience has provided a good example on the potentials of waste as a resource for alternative livelihood and the benefits of formalizing the waste recycling activities. With doy packs and colored magazines as raw materials, the workers of the cooperative turned them into fashionable products such as bags, shoes, office and school supplies, necklaces and other accessories, wherein most of these products are exported in about 17 countries. At present KILUS provides livelihood for more than 200 families, most of them used to be jobless before. For in-house worker, the average salary is P2,000.00 per week (P250– P300 per day); for those working at home, the income ranges between P3,000.00– P5,000.00 per week because other members of the family also help so they can produce more (Atienza 2010). This amount of salary is already comparable to a worker in a formal company or factory.

To facilitate more effective and more efficient collection of waste by providing more accessible avenues for disposing waste, the Philippine Business for the Environment (PBE) also implements the RCEs and Waste Markets in partnerships with DENR, local governments, business sectors (mall operators particularly SM Supermalls and Ayala malls, recyclers, etc.), and the community. Table 4 shows the kind of recyclable waste, amount and value of recyclables collected during RCEs from 2002-2006. Waste markets are part of the corporate social responsibility (CSR) programs of the business sector to contribute in addressing waste management concerns. From 2007/2008 when Waste Markets started, Ayala Malls Group reported a collection of 46 tons of waste equivalent to P267,000.00; and the SM Supermalls has collected 417 tons of waste equivalent to P2.6 million. For RCEs, it was reported that a 2,336 cu m. of recyclable materials worth P3,434,769.67 was collected since the start of this activity in 2002 (Antonio 2010).

Table 4. Amount and value of recyclable wastes collected in Recyclable Event

| Recyclable wastes | Unit | Amount (2002-2005) | Amount (2006) | Sum |
|---|---|---|---|---|
| Waste paper | kg | 58,661 | 25,378.3 | 84,039.3 |
| Car battery | pcs | 10,119 | 410 | 10,529 |
| Personal Computer | pcs | 3,426 | 824.2 | 4,250.2 |
| Aluminum can | kg | 919 | 169 | 1,088 |
| PET bottle | kg | 1,520.5 | 1,123.2 | 2,643.7 |
| Waste plastics other than PET | kg | 560 | 773.5 | 1333.5 |
| Toner/Ink cartridge | pcs | 1,593 | 1,426 | 3,019 |
| Tire | pcs | 543 | 93 | 636 |
| Glass bottle | kg | 173.5 | 588 | 761.5 |
| Iron/steel scrap | kg | 108 | — | 108 |
| Scrap alloy | kg | 2 | — | 2 |
| Paint can (tin plate) | pcs | 90 | — | 90 |
| Tin can (tin plate) | kg | | 256.4 | 256.4 |
| Scrap metal | kg | | 612.5 | 612.5 |
| Amount of money | PHP | 1,434,778 | 386,909 | 1,821,687 |

Source: Business and Environment, Second quarter 2006 as cited in BOI-DTI/JICA 2008.

Another recent initiative is addressing the concern on managing the residual plastics. In Payatas, Quezon City, they are conducting a Pilot testing of the Department of Science and Technology- Industrial Technology Development Institute (DOST-ITDI) Plastic Densifier technology. This technology is simple and affordable which converts waste plastics especially styro, polyethylene and polypropylene plastic bags into useful products such as pathway blocks, tabletops, chairs and floorings. Through the management of the Payatas Operations Group and with collaboration DOST-ITDI and IPM Environmental Services, Inc., they are also looking on the viability of the livelihood of Payatas waste pickers based on this technology.

## 5.4 Promoting the Waste Recycling Industries

From the above discussions, it shows that with the projected increase of population in the country especially in urban cities, the increasing rate of waste generation is inevitable, thus there is an urgent need to manage waste more effectively and efficiently. Given the limited resources in terms of technical and financial, this situation poses a great challenge to both the national and local government to develop more innovative and possible approaches. On the other hand, considering the characteristics of waste being generated, this situation also offers opportunities on how waste can be managed with limited cost but with higher efficiency and at the same time can also provide livelihood through composting and recycling. The cases presented earlier also show the benefits and potentials of recycling if only these simple technologies such as the construction of MRF, the strict implementation of waste segregation at source, the inclusion of other market-based policy instruments such as the incentive rebates program and waste-for-goods exchange programs to encourage community participation, and other innovative approaches to facilitate waste collection can be properly implemented and replicated nationwide.

### *Factors Affecting the Growth of the Recycling Industry*

Given the potentials and benefits of recycling both in addressing waste management problems and in alleviating poverty as shown by the experiences of the cases discussed in Part III, there is a need to boost the recycling industry to sustain the waste management program. Thus, it is important to consider some of the factors that affect the growth of the recycling industry in the country. This includes the following:

Readiness of the community and other stakeholders –Based on the report by Aguinaldo (2009), there is only 31% recycling rate in Metro Manila in 2009 (after 8 years since the implementation of the RA 9003 in 2001). It is assumed that there is even a lower recycling rate in other parts of the country. This means that the required element to boost the recycling industry is not yet established. This is also manifested in the weak compliance of the LGUs in the waste management programs as presented in Table 3 (Inventory of Disposal Facilities as of third quarter 2010). However, although there is a low recycling rate in MM, it is also noticed that there is an increasing rate from 13% in 2000, 25% (2002), 28% (2006) to 31% (2009) (Ibid.). This shows that although changing people's behavior particularly on their perceptions about waste and its

management takes time, it could be possible if only they would be provided with the right information not only about the hazards of improper waste management but also about the benefits of proper waste segregation and recycling. Thus, strong IEC campaigns through multi-sector partnerships should be strengthened.

Political, Technical and Social Factors – As shown in Figure 5 (Environmental Governance towards Sound Solid Waste Management), the integration or the participation of the various stakeholders such as the policy regulators, the community and other organizations is necessary to identify and implement appropriate technologies in moving towards sustainable waste management. This is corroborated by the experience of the cases discussed wherein they were able to have achieved breakthroughs in managing their waste through multi-sector partnerships, increased awareness among stakeholders and promotion of simple and low cost technologies.

In addition, as shown in Figure 6 (Towards a Sustainable Recycling Industry), a proper waste management through segregation is necessary to promote recycling; and recycling can be possible by the use of appropriate or possible technology. Also, to sustain the human's behavior of practicing waste segregation and recycling, they should also be benefited from this activity and this can be possible by transforming the recyclables into recycled products. Thus, there is a need to create markets for recycled products to assure the sustainability of the recycling industry. Without the recycling industry that could translate these recycling activities (or the recycled products) into a resource (or economic benefits), the implementation of proper waste management may eventually die in the future. Therefore, there is a need to boost the recycling industry to assure the sustainability of the waste management program. Thus, the government should also provide policy support to promote the recycled products and to encourage businessmen to invest in this kind of business by providing benefits such as tax reduction, etc.

Geographical, Transportation, and other Factors – Another important factor that affects the recycling is the archipelagic nature of the Philippines and the lack of infrastructure for efficient transportation. Since most of the big recycling industries are located in Metro Manila and nearby provinces, the lack of recycling facility in other regions interferes their recycling activities. To cite for example, the case of Brgy. San Manuel in Puerto Princesa, Palawan (Region IV-B, about 567 km away from Manila). Previously, the barangay has Memorandum of Agreement (MOA) with the three junkshops who collected their collected recyclables. In the year 2007, the barangay earned P34,000.00 for selling recyclables. But for more than a year already, the

operation of junkshops stopped due to lesser vessels/ships to transport waste to Manila. This is due to significant decrease in the amount of air transportation from Palawan to Manila, so there is no passenger vessels anymore (only cargo ships but the priority is basic commodity). Other issues that affect the recycling industry include the global crisis that has caused significant reduction in the prices of recyclables.

Fig. 6. Towards a Sustainable Recycling Industry

## Conclusion

Based on the review of the current waste management system in the Philippines and the status of compliance, it shows that government alone cannot solve this gargantuan problem of waste. The creation and implementation of policies is an important element in dealing with the different issues and concerns in the governance of solid waste. Polices are necessary for planning, design and operation of the solid waste management programs. Their absence can impede or limit improvements in garbage collection and disposal (Ocenar 2001).

However, from the Philippine experience it shows that policies though they are important element in the planning and operation of the solid waste management

programs, will not be implemented successfully without the application of good governance that would promote participation of the different stakeholders. In addition, the lack or weak compliance from waste management policies also proves that no "best policy" can be effectively enforced by just merely looking on the "environmental and technical" aspects of the situation and without considering the other and equally important issues such as the social and economic aspects.

The promotion of awareness campaigns in bringing the right information to the people to make them understand what the policies are all about is very important. As shown in the discussion earlier, waste management problem is not simply about waste but it is more on the lifestyle of the people that changes through time and the continues search for a better life. Thus, addressing waste management issues do not only involve environmental concerns but also economical and social concerns.

Therefore, the application of good governance through participation of various stakeholders, strong awareness campaigns and promotion and replication of innovative and appropriate technologies are necessary to achieve sound waste management and sustainable recycling industry.

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[i] Atienza, 2008. Breakthroughs in Solid Waste Management: Lessons from Selected Municipality and Barangay in the Philippines. ARPA XX (1-2): 82-98.

[ii] In support of the implementation of RA 9003 and to encourage all barangays to practice solid waste management, the city government of Quezon City enacted Ordinance No. SP-1203, S-2002, known as the "Best Solid Waste Management Incentives in Barangays" in December 3, 2002 (Quezon City 2002). According to this ordinance, a barangay is entitled to receive an incentive package in the form of financial assistance from the city government for practicing best practice solid waste management.