Solid Waste Management Practices of the Youth: Its Implication to Environment Protection

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ABSTRACT

Solid waste management (SWM) practices if not done properly is the key to all environmental problems. The youth, when taught the proper way of waste segregation will help the government address these problems. The youth comprises the biggest number of population in the country. It is for this reason, that this research was conducted to determine the solid waste management practices of the youth enrolled at New Sinai Schools and Colleges (NSSC) in Sta. Rosa, Laguna. The study utilized the descriptive method of research. There are 82 respondents of the study. This investigation made use of a questionnaire checklist and semi structured interview. The quantitative data were analyzed using descriptive statistics. Ethical protocol was employed in the study. Results showed that Solid waste management practices of the youth in terms of solid waste disposal is considered average and low in terms of reusing disposed solid wastes. Fresh air is ranked first based on the respondents' knowledge on SWM practices to the environment and inadequate materials and facilities for solid waste management is the first problem encountered by the respondents. The New Sinai Schools and Colleges should come out with an action plan on solid waste management.

Keywords*: Laguna, reuse, sanitation, sustainability, waste reduction*

INTRODUCTION

People in the world are concerned nowadays with environmental issues because of the rampant environmental tragedies and catastrophes that happened recently. They become vigilant about the role of the citizens in their particular country. In the Philippines, most people including the youth are now mindful of their roles and duties in taking care of the environment.

With the rapid development of cities and increase of population, new pressures and challenges confront solid waste management of the urban environment. Solid waste management is a serious concern because it has serious effect on the environment if it not taken care of properly. If people have the careless attitude, they end up losing their environment where they live. Effective solid waste management is everybody's concern to take care of the environment where their existence depends.

The Philippine government gives high premium to environmental protection. It is in the mandate of the government to protect the environment hence it is one of the basic state policies of the country. The National Solid Waste Management Commission Secretariat of the Environmental Management Bureau (EMB) estimated that the per capita waste production daily is 0.5 kg. With the present population of 10.5 million, the total solid waste that can be produced in Metro Manila alone is estimated to run up to 5,250 metric tons per day or 162,750 metric tons per month or 1.95 million metric tons per year. With these numbers, it is not surprising that solid waste management is a serious problem the government has to face.

While the waste stream for reuse and recycling only accounts for a minor part, landfilling is still a predominant disposal method compared with composting and incineration. Many environmental problems turn out to be critical to the Philippine Environmental Management Bureau (EMB, 2000) which include also air and water pollution, in which the latter find the way to land and contaminate arable lands.

Solid Waste Management, according to Williams (2008), can be defined as the control of the generation, storage, collection, transfer and transport, processing and disposal of solid waste in accordance with the best principles of public health, economics, engineering, conservation, aesthetics and environmental protection.

Sustainability of the solid waste management is important. This is because the waste generated by the populace is continuous. Since it is continuous, there is a need to sustain it to a certain level that it is not only functional but effective at the same time. As such, it became a pivotal concept in the protection of environment. White et al. (2005) have identified two aspects that are required in solid waste management: environmentally and economically sustainable. Environmental sustainability refers to the process of reducing the environmental impacts of solid wastes as far as possible while the latter, economical sustainability means that the solid waste management options must be cost effective and affordable to society. The social dimension of sustainable solid waste management requires that the most desirable waste management options must also be acceptable to the community and take into consideration the interest of future generations.

Solid waste management can be holistic or integrated. Holistic solid waste management means that different operations and components of waste management will be systematically organized and coordinated throughout the entire process. Integrated solid waste management, on the other hand, focuses on having all types of waste dealt with by the best available options. All these notions are in fact supplementing or supporting each other.

Miller (2001) contended that there are two ways to deal with the solid waste management and pollution prevention. Waste management is a high-waste approach that views waste production as an unavoidable product of economic growth. Hence, it manages the resulting wastes in such ways that reduce environmental harm, whereas reduction and pollution are the other approach, low waste that view most solid wastes as potential resources for recycling, reusing or composting.

With reference to the U.S. National Academy of Sciences (2010), the low-waste approach should have the following hierarchy of goals: reduce waste and pollution, reuse as many things as possible, recycle and compost as much waste as possible, chemically or biologically treat or incinerate waste that cannot be reduced, reused, recycled, or composted, and bury what is left in state-of-the-art landfills or above-ground vaults after the first four goals have been met.

McDougall, Peng and Arakaki (ISWA) (2000), pointed out that the above "waste management hierarchy" which implied the use of a priority list for the various waste management options has serious limitations as follows: The hierarchy has little scientific or technical basis; The hierarchy is of little use when a combination of options is used, as in an Integrated Waste Management (IWM) system. In an IWM system, the hierarchy cannot predict, for example, whether composting combined with incineration would be environmentally preferred to materials recycling plus landfilling. What is needed is an overall assessment of the whole system, which the hierarchy cannot provide. The hierarchy does not address costs and cannot assess the economic affordability of waste systems.

The enactment of the Philippine Republic Act No. 9003, or the Ecological Solid Waste Management Act, paved the way for a shift from indiscriminate waste disposal to institutionalized proper solid waste management at every household and community. By requiring the segregation of solid waste at the source, the law educates every son and daughter, the basics of proper environmental management, with the hope that, as they grow older, the environmental consciousness may be brought into their school, business, and place of work. The compliance with other environmental standards on wastewater, air emissions, medical and hazardous wastes would no longer be difficult to comprehend and can easily be made part of the day-to-day practice of everyone of every business and industry in the country. The law does not stop there. Solid Waste minimization is also one way of doing it is through "cash from trash". Another way is the development of material recovery programs that break recyclables from monopoly of junkshops to resource opportunity for each household or community (United Nations Development Programme).

Solid Waste management in the Philippines has been an issue for over the past twenty years now. Waste management problem arise due to improper implementation of the waste management programs in most localities in the country. Solid Waste Management is the proper transfer, collection and management of waste. Examples of which are recycling, incineration, gasification, landfills and dumps. However, there are cities in the Philippines that are applauded because well execution of their solid waste management systems. Sindalan, San Fernando Pampanga is one of the few municipalities in the Philippines that established their own recycling facility. It is something commendable because it helps the environmental conservation and improvement of the aesthetics of the place.

The DENR have been making actions to improve the solid waste management of the schools here in the country. The schools are recognized for their effective solid waste management programs and consequently, they are given prizes for such achievement. A total of 45 public and private schools have entered the finals of the 2011 National Search for Sustainable and Eco-Friendly Schools, which was organized by the Department of Environment and Natural Resources – Environmental Management Bureau (DENR-EMB), Department of Education (DepEd), Commission on Higher Education (CHED) and Smart Communications, Inc. (Smart). The then Environment and Natural Resources Secretary Ramon J. P. Paje said the schools' response to the call for entries was "overwhelming". On its second run, the nationwide competition aimed to recognize which among the educational institutions from the elementary, high school and tertiary levels has the best sustainable and environment-friendly programs and activities. Said nationwide search is the Philippine's initiative in support to the ASEAN Environmental Education Action Plan (2008-2012), and the United Nations Decade of Education for Sustainable Development (Solid Waste Management, 2011).

The experiences and practices of households on solid waste management of a certain Barangay (village) in Manila, Philippines were documented by Bernardo in 2008. Based on the interview, the data were gathered through an interview with household member respondents using open-ended questions. Interviews were also conducted with garbage collectors as well as scavengers. Results showed that households generated an average of 3.2 kg of solid waste per day, or 0.50 kg/capita/day. The types of wastes commonly generated are food/kitchen wastes, papers, PET bottles, metals, and cans, boxes/cartons, glass bottles, cellophane/plastics, and yard/garden wastes. The respondents segregated their solid wastes into PET bottles, glass bottles, and other waste (mixed wastes). None from the respondents performed composting. It is worth noting, however, that burning of waste is not done by the respondents. The households relied on the garbage collection by the government. Collection was done twice daily, except Sundays, and household members among their garbage when the garbage truck

arrives. However, there are those who dumped their garbage in non-designated pick-up points, usually in a corner of the street. The dumped garbage becomes a breeding ground for disease-causing organisms. Mothers and household helpers were responsible for household solid waste management. Scavengers generally look for recyclable items in the dumped garbage. All of them said that it is their only source of income, which is generally not enough for their meals. Most of the respondents said that garbage collection and disposal is the responsibility of the government. The results of the study showed that RA 9003, also known as the Ecological Solid Waste Management Act of 2000, is not fully implemented in Metro Manila (Bernardo, 2008).

Similar results on highlights were drawn from the study conducted in 2007 whereby it analyzed the solid waste management practices of the waste generators of the people of Bacolod city, and the extent of their compliance with the Republic Act 9003, otherwise known as the Ecological Solid Waste Management Act of 2000. The findings of this study served as bases in developing a handbook on solid waste management (Ballados, 2010).

The Motion town government in Samar vowed to intensify the implementation of its Solid Waste Management Program. The town government strictly implemented the "no segregation, no collection policy" in all of Motiong's Barangays and urged the Barangay officials to put up a Materials Recovery Facility (MRF) where they can segregate bio-degradable and non-biodegradable waste materials. Such materials can be turned into a livelihood as, according to Langi, "there is money in junk" (Abrematea, 2012).

The problems associated with solid wastes are greater in public places due to lack of disposal facilities and the absence of people's trainings on proper solid waste management. A large number of residents in a limited space plays a vital role in the unsanitary practices of the people.

The people who live in the community play an important factor in protecting the environment from destruction. Many studies and different types of respondents were conducted on solid waste management. However, there is a nil number of researches conducted on the youth's knowledge and practices on solid waste management. The youth comprises the biggest number of population in the Philippines and therefore, must be given the preferential attention on such kind of study. They can make a difference too in the protection of the environment.

It is, for the abovementioned reason, that the researcher made a study on the solid waste management practices of the youth and its implication to environment protection. She believed that the country has the human resources, the youth to protect the environment.

This research determined the demographic profile of the respondents in terms of age, gender, program of education and curriculum year level. Further, the study determined the level of solid waste management practice of the youth in terms of solid waste disposal and reusing solid waste materials and their Knowledge on the effect of home practices on solid management to the environment. Problems encountered by the youth in disposing solid waste management were also looked into further, the effects of the solid waste management practices at home to the environment.

METHODOLOGY

The study used the descriptive method of research. The researcher gathered information from the 82 students enrolled at New Sinai Schools and Colleges (NSSC) at Tagapo, Sta. Rosa City of Laguna. They came from three degree and TESDA Accredited programs. They were purposively selected because they live in communities adjacent to Sta. Rosa City of Laguna. This investigation made use of a questionnaire checklist and semi structured interview. The researchers asked permission from authorities to conduct the study. Ethical considerations were employed like, voluntary participation of the subjects, confidentiality of gathered results and respect was maintained all throughout the conduct of interview and floating of questionnaires. The researchers explained the objectives of the research and the benefits derived from the conduct of research. No harm was done to anyone. In the statistical treatment mean and rank were used.

The following is the norm used in the study.

Norm	Item Descriptive Rating	Overall
4.21-5.00	Very highly practiced	Very Good
3.41-4.20	Highly practiced	Good
2.61-3.40	Moderately practiced	Average
1.81-2.60	Practiced	Low
0.00-1.80	Slightly practiced	Lowest

RESULTS AND DISCUSSION

Majority (55/67%) of the respondents are in their adolescence stage aged 18-20 years old; 11 or 13 percent aged 21-23 years old; 10 or12 percent aged 30 and above years old; and 3 or 4 percent aged 24 -26 years old and 3 or 4 percent aged 27-29 years old respectively. Majority of them (58 or 71 percent) are female and 24 or 29 percent are male. When grouped according to year level, there are 28 or 34 percent who are first year students; 27 or 33 percent second year students; 15 or 18 percent third year; and 12 or 15 percent TESDA program students. As to program

affiliations of the respondents, there are 37 or 45 percent who are in the Bachelor of Science in Medical Technology; 21 or 25.6% percent Bachelor of Science in Psychology; and 12 or 15 percent Bachelor of Radiologic Technology, and TESDA programs respectively.

As gleaned on Table 1, the respondents highly practiced (X=3.60) separating solid waste materials left on their plates before washing the dishes. This could be due to their Childhood training in their homes, they helped their parents in household chores. On the other hand, the respondents practiced (X=2.14) reading new articles about solid waste management. They do not regularly read due to many lessons they need to study or are busy with their assigned works. Overall, the respondents practiced in the average (X=2.70) level on proper solid waste disposal, it could be due to their not reading or watching proper solid waste disposal. They are not aware of the hazardous effects of wastes if not handled properly. Miller (2001) contended that there are two ways to deal with the solid wastes people create: (1) waste management and (2) pollution prevention or waste reduction. Waste management is a high-waste approach that views waste production as an unavoidable product of economic growth. It attempts to manage the resulting wastes in ways that reduce environmental harm. However, preventing pollution and waste is a low-waste approach that views most solid waste as potential resources that one should be recycling, composting, or reusing.

Table 1
Solid Waste Management (SWM) practices of the youth in terms of solid waste disposal

	Criteria	X	Verbal Interpretation
1.	I segregate solid waste material as biodegradable from non-biodegradable at home.	3.04	Moderately Practiced
2.	I note the schedule of collection of solid waste material in my neighborhood,	2.64	Moderately Practiced
3.	I throw the solid waste material to the can properly identified as biodegradable or non-biodegradable.	3.06	Moderately Practiced
4.	I separate the solid waste material left on the plate before I wash the dishes.	3.60	Highly Practiced
5.	I use a code in disposing the solid waste at home.	2.30	Practiced
6.	I follow a regular schedule of disposing the solid waste material at home.	2.50	Practiced
7.	I maintain the cleanliness of the place where the cans for the solid waste material are located.	2.56	Practiced
8.	I read new articles about solid waste management to improve my system of waste disposal at home.	2.14	Practiced
9.	I live with the principle “Ang malinis na kapaligiran ay susi ng magandang Kalusugan.”	2.76	Moderately Practiced
Overall Mean		2.70	Average

Table 2 presents how the respondents managed wastes in terms of reusing disposed solid wastes.

Table 2
Solid Waste Management (SWM) practices of the youth in terms of reusing disposed solid wastes

Criteria	X	Verbal Interpretation
1. I separate the solid waste materials according to: bottles, plastics, cans and other scraps.	2.71	Moderately Practiced
2. I clean the bottles, plastics, cans and other scraps with the water to remove the leftovers inside them.	2.42	Practiced
3. I place the bottles, plastics, cans and other scraps to their respective containers at home.	2.36	Practiced
4. The bottles, plastics, cans and other scraps that are reusable are placed in another can.	2.32	Practiced
5. I reuse solid waste materials whenever possible for the second time before finally disposing them.	2.20	Practiced
6. I sell the solid waste materials such as bottles, plastics, cans and other scraps to scavenger.	2.42	Practiced
7. I use solid waste materials as decorations at home.	1.93	Practiced
8. I share available solid waste materials to some of my neighbors as the need arises.	1.93	Practiced
9. I check regularly the cleanliness of the place where I keep the solid waste materials	2.14	Practiced
10. I offer insights to my friends about solid waste materials	1.93	Practiced
Total	2.24	Low

The respondents moderately (X=2.71) practiced the separation of the solid waste materials according to: bottles, plastics, cans and other scraps. It could be that only those required to do so in their places were the ones who performed. On the other hand the youth respondents practiced solid waste management in terms of reusing disposed solid waste on the following: cleaning of bottles, plastics, cans and other scraps with the water to remove the leftovers, placing such materials to the respective containers at home, placing in another container/bottles, plastic/s, cans and other scraps that are reusable, reusing solid waste materials whenever possible for the second time before disposing them, selling such solid waste materials to scavengers, using solid waste materials as decorations at home, sharing available solid waste materials to some of their neighbours as the need arises, and checking regularly the cleanliness of the place where they keep the solid waste materials. Overall the respondents practiced lowly (X=2.24) solid waste management in terms of reusing disposed solid wastes. It could be due to lack of knowledge and orientation of the students on the importance of reusing disposed solid wastes. They are busy with their studies; they lack commitment or environmental sensitivity and do not have enough time to do so.

Cruz and Tantengco (2017) in their findings mentioned that based on the responses in the modified Environmental Awareness Scale, the respondents were aware of the environmental concepts. Interviewees revealed that despite the programs about environment, not all of their students have initiatives in keeping the school campus clean and recycle solid wastes however through the guidance of their guardians and parents, the students participate in solid waste management practices at home.

Solid-waste management is a multidimensional issue that incorporates institutional, political, environmental, social and economic aspects. Improving Solid Waste Management in developing countries like the Philippines needs great efforts to improve public awareness (McAllister 2015).

Table 3 reveals that Fresh air is ranked first based on the respondents' knowledge on SWM practices to the environment, it could be due to their awareness of the surprising health benefits of fresh air like it clears the lungs, lowers blood pressure, refreshes, hastens digestion and heals one in many ways.

Kelly and Fussell (2015) mentioned that moving towards a healthier environment depends upon achieving the right public attitude and behaviour by the use of optimal air pollution monitoring, forecasting and reporting that exploits increasingly sophisticated information systems.

The respondents ranked "Fertile soil suitable for a variety of crops" the least it could be that they are not aware of its importance due to their lack of knowledge in agriculture. Ann M. De Lay and Swan (2014) mentioned that the apathy in Agriculture is born of own choice and developed through inclinations and depending on learning purpose.

Table 3
Knowledge of the NSSC youth on the solid waste management practices to the environment

Effects to the environment	Rank
Clean and orderly environment	2
Fresh air	I
Clean river which may serve as source of fresh water fish and other marine products	4
Clean water supply that is potable for drinking	3
Fertile soil suitable for a variety of crops	6
lower rate of flooding	5

Table 4
Problems encountered by the youth in disposing solid waste materials

Problems Encountered	Rank
Big Population	7
Inadequate government policy	8
Indifferent Attitude	2
Inefficient coaction of garbage	6
Increasing urbanization	5
Inadequate materials and facilities for solid waste management	1
Passive government officials	9
Insufficient information about the effects of solid waste management to the environment	4
Inadequate training about solid waste management practices	3

Table 4 presents the ranking on youth's problems encountered by the respondents in the disposal of SWM.

As shown in Table 4, the youth respondents ranked the problems they encountered in disposing solid waste materials in the environment, first is "Inadequate materials and facilities for solid waste management ranked first". This is a common problem in many institutions the lack of materials and facilities, could be the space where to place the solid wastes and lack of funds to have all these. This result confirms the findings of Oloruntoba et al. (2015), they mentioned that inadequate waste management facilities, practices in institutions and the lack of refuse bins may have contributed to waste spillages and the burning practices. These are the major problems perceived by the students on disposal methods.

On the other hand, the least problem according to the respondents of the current study "Passive government officials" as ranked 9. It implies that the government officials of the site of the study are energetic. They are participating and leading the community along solid waste management practices and they are not considered problems to the young. This result strengthens the findings of Macawile and Su (2009) who mentioned that local government officials unveiled that in the attainment of sustainable waste management, this is a joint responsibility of the government and its people in the community.

CONCLUSIONS

Majority of the respondents are in their adolescence stage aged 18-20 years old and female. Solid waste management practices of the youth in terms of solid waste disposal is considered average and low in terms of reusing disposed solid wastes. Fresh air is ranked first based on the respondents' knowledge on SWM practices to the environment and inadequacy of materials and facilities for solid waste management is the first problem encountered by the respondents.

RECOMMENDATIONS

An inefficient school and home solid waste management system may lead to negative environmental impacts like infectious diseases, land pollution, obstruction of drains and loss of biodiversity. The New Sinai Schools and Colleges should come out with an action plan on solid waste management. They should have programs on enhancing knowledge and practices of the youth on solid waste management such as trainings, seminars, conferences, symposia where they could exchange their ideas with others belonging to same age bracket. In such avenues, the youth are able to learn from each other's experiences, thereby, improving further their solid waste management practices in their homes. The respective curricula of the youth may also include a topic on solid waste management to reinforce their knowledge. Furthermore, the youth are encouraged to always practice solid waste management wherever they are, be it in their community, in churches, or in any public place.

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