I. Ecological Waste Management in Communities

A. Solid waste defined; types of solid wastes

Solid wastes are any discarded (abandoned or considered waste-like) materials (Official Gazette, 2001). It can be classified into three (3) types depending on its source: household (municipal waste), industrial (hazardous waste), and biomedical or hospital wastes (infectious waste) as cited by Singh and Ramanathan in 2013.

Household or domestic wastes refer to solid wastes generated by people in their residential or dwelling places as a result of day-to-day living activities (WebLaws.org, 2013). Moreover, industrial wastes are waste produced from business services and manufacturing activities (Toowoomba Regional Council, n.d.) while biomedical or hospital wastes are medicinal products or hospital equipment that are discarded or considered useless produced in the diagnosis, treatment, immunization of humans and/or animals or research (Antimicrobial Resistance Network, 2007) .

Below are the four categories of garbage and examples according to Singh and Ramanathan in 2013:

- Organic waste: Kitchen waste, vegetables, flowers, leaves, fruits.
- Toxic waste: Old medicines, paints, chemicals, bulbs, spray cans, fertilize, pesticide containers, batteries, shoe polish
- Recyclable: Paper, glass, metals, plastics
- Soiled: Hospital waste such as cloth with body fluids

B. Facts and Figures on solid waste management at the national and local levels

The Environment Management Bureau- Department of Environment and Natural Resources (EMB-DENR) stated that in the Philippines, the solid waste problem is most serious in urban centers, particularly in Metro Manila, because of the high population density, the high consumption rates, and the concentration of packaged goods, some of which are made with raw materials that are toxic and nonbiodegradable. The 2016 data on waste projection shows that NCR Region got the highest waste generation with 9, 212.92projected tons of waste per day (National Solid Waste Management Commission [NSWM], 2016) . With these tons of waste, 52% are biodegradable, 41% are recyclable, 7% residuals (NSWMC, 2016). . At the national level, report shows that in 2008-2013, 56.7% of solid waste came from residential waste, 27.1% commercial, 16.2% from other sources like industrial and institutional wastes (Environmental Management Bureau and National Solid Waste Management Commission, 2015). From these wastes,

52.31% are bio-degradable, 27.8% are recyclables, 17.8% residuals, and 1.93% special waste (Environmental Management Bureau and National Solid Waste Management Commission, 2015.

These mean that the bulk of solid waste in the country comes from households, followed by commercial or industrial waste which is alarming because these can be toxic and hazardous. On the other hand, recyclable wastes constitute plastics (38%), paper and cardboards (31%), and metal, glass, textile and rubber (31%). These wastes are often improperly handled and just thrown anywhere polluting the environment, especially water bodies.

In Laguna de Bay, there are 8.4 million of people residents living around the lake and an estimated of 60% of this population dump their solid and liquid waste directly through the lake's tributaries which is around 10% of the 4,100 metric tons of wastes produced by the residents in the area (LLDA, 2005 as cited by UP Open University, n.d). This poor solid waste management have negative impacts on health and environment.

II. Impacts of Unmanaged Solid Wastes

Solid wastes, when improperly managed, can put communities at risk of injury and infection. Groups of people living in a place where there is no proper waste disposal method, people living close to a waste dump, children, waste workers, and animals are vulnerable to the adverse effects of solid wastes (Alam and Ahmade, 2013).

A. Health Impacts of unmanaged solid wastes on the community

Solid wastes pollute the water and increase the risk of water-borne diseases. Industrial wastes can be toxic and can contaminate the water bodies with heavy metals that can cause illnesses to humans and other organisms. Furthermore, study shows that exposure to solid wastes can lead to low birth weight, cancer, congenital malformations, neurological disease, nausea and vomiting, and respiratory diseases (Alam and Ahmade, 2013)

B. Impacts of unmanaged solid wastes on the environment (flooding, pollution, etc.)

Aside from the health impacts on people, unmanaged solid wastes have also negative effects on the environment. These solid wastes aggravate other problems such as disasters caused by flooding due to clogged waterways. Garbage obstruct or clog the flow of water on rivers, canals, and other wetlands, worsening the

flooding situation in an area. Solid wastes are also major contributors in rendering some wetlands to become biologically dead, such as some portions of the Pasig River.

Moreover, Alam and Ahmade mentioned in 2013, that solid waste causes mercury toxicity of water bodies, plastics in the ocean which are ingested by birds, high algal population in rivers and lakes causing oxygen deprivation of marine organisms and to fish kill, and degradation of water and soil quality.

III. Innovative activities to help manage solid wastes in homes, schools and communities

With the prevalent problems of solid waste management in the Philippines, there is a need for interventions that are multi-sectoral in nature.. Below are some of the examples of the projects and activities that can be done by the youth and other stakeholders to help address such problems.

A. Sachet Recovery Project (SRP)

The SRP aims to empower the youth, and other sectors to take active role in solid waste management. Also, this intervention targets to reduce the amount of sachets being dumped in wetlands.

Post-consumer waste, such as sachets from shampoo, dishwashing liquid, laundry soap, and the likes are being collected and used as one of the materials for paver production or brick-making. In an ongoing partnership between an industry and the SCPW, 170 kilos of sachets can be converted into 1000 pieces of pavers or bricks. The project encourages the participation of different sectors such as local government units, industry and school. The pavers are donated back to the schools that collected the sachets and are being used as flooring in classrooms or walkways in their school campuses.

B. Wetland Clean-up with Information Campaign

Clean-up activities are more effective when it is accompanied with an information campaign. Without the latter, the area will tend to return to its polluted state again because the people will continue throwing garbages indiscriminately and using more plastics if they are unaware of the consequences of this kind of practice and of proper solid waste management.

The organizers may hold short seminars or forum before the clean-up event, commitment setting activities and short program, or produce IEC materials to raise

awareness. This activity should be done at the community level (Barangay or Sitio) and be part of a solid waste management program in order to sustain the interest of the people. Eventually, these activities when done regularly will instill in the community the values of waste management and influence behavior that predispose waste segregation at source. When this happens, clean-ups might not be anymore necessary except when the community needs to show solidarity in their solid waste management program.

C. Composting and Home/School Gardens

Composting is a natural process of decomposition of organic waste that yields compost, which is rich in nutrients and an excellent medium for growing plants (University of Georgia Cooperative Extension, 2013). With composting, the waste will not carelessly be thrown or left rotten, and the amount of disposable garbage will be reduced. It also recycles the nutrients in the soil and is very effective with home and school gardening since the organic fertilizer that will be produced from composting can be used instead of chemical fertilizers. It also increases the soil's ability to hold water and help the soil retain more of the plant nutrients (University of Georgia Cooperative Extension, 2013).

With the bulk of kitchen produced in home and schools,composting can be easily done even by youth.

IV. Field observation of solid waste management in the community and crafting of activity to help manage SW.

Field observation activity is taken to expose the participants to the community surroundings and to personally see and closely observe the lake and the lakeshore communities, and the existing problems and issues thereof.

In this trip, the participants are divided into groups and facilitated by teachers and the organizers on gathering of data. The participants will be asked to observe the community and take note these observations. To substantiate the data, the participants can be tasked also to do interviews to the residents and officials in the barangay.

After the trip, the students will prepare assess the data they have collected and analyze it. Below is sample format of tabulating the data that will be gathered:

How the Community Looks Like Today (Current State)	What can we do? (action points)	How the Community Will Look Like 5 Years from Now (Vision)

The facilitator will then process the data after all the reporting and guide them on crafting their action plans.

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