Solid Waste Management in an Upland Urban Village of Samar Philippines

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Abstract

The study assessed the current household Solid Waste Management (SWM) in an upland urban barangay (village) in Catbalogan City, Samar, Philippines. This uphill barangay is inaccessible by garbage truck and depends mostly to the barangay officials' initiative to collect and dispose waste. Solid waste information and practices were qualitatively and quantitatively extracted from interview schedules administered to household waste generators and through focus group discussions conducted among key officials of the barangay unit. Majority of the residents are very much aware of the ineffectiveness of the current waste management system and suggest a strong implementation of the policies on SWM. Very few of the residents practice recycling and composting due to lack of perceived benefits of doing such. Public awareness campaign is seen as an initial step in a successful implementation of SWM. This paper also discusses review of theories and designs for an effective participatory community-based SWM strategy for the said barangay.

Keywords: Solid waste management, upland barangay, community-based, participatory, Catbalogan

I. INTRODUCTION

Waste is a by-product of any human activities which involve an inorganic or organic material. Law of nature governs that all things are bound to disorder, hence, into a less useful one. A material that is no longer useful or consumable to one is considered as waste, but this same waste may also find some value to other people. However, recycling used materials is inconvenient to some because it requires more energy to restore the original value of the material. For kitchen refuse and other biodegradable materials, they can be turned into organic fertilizers through composting but only 40-50% of average biodegradable waste is converted into compost (Eurostat News release, 2014). The remaining percentage would just rot on the ground leading to an unsanitary environment causing human health and ecological problems. The problem is aggravated when there is no proper segregation of waste from combustible to non-combustible one. Most of the wastes generated are non-biodegradable that would take years to decay. They first clogged the drainage and pipes eventually causing flood when rain comes.

In the Philippines, a law is enacted to

solve the problems of waste management. The law, RA 9003, otherwise known as Philippine Ecological Solid Waste Management Act of 2000, mandates every local government unit (LGU) to allot funds, manage, dispose and even construct recycling facilities in their area. However, implementation of the law is not easy. It faces a lot of challenges such as the lack of financial resources and lack of authority to make financial and administrative decisions. No proper institutional set-up for solid waste management, difficulty in locating and acquiring landfill site, and poor public cooperation are some challenges (Ballados, 2010). Massive public information coupled with utmost support and cooperation of every stakeholder are crucial to the successful implementation of the law.

The study aimed to assess the current solid waste management in an upland village that is inaccessible by garbage truck due to its uphill location and design a model that best solicit participation among the residents of the barangay. Review of literature was undertaken, and there are not much literature on uphill urban village and their solid waste management. Hence, this paper looks into a literature for the design of SWM that fits the characteristics of the said barangay. There are three components of this study: 1) Assess the SWM and characterize the garbage profile; 2) Conduct FGD and consultative assembly with the stakeholders and 3) Design a model through review of literature that fits the characteristic of the area.

Theoretical Framework

The study is anchored on the participatory model of action research (PAR) by Chevalier and Buckles (2013). PAR is an approach to research in communities that emphasizes participation and action. It seeks to understand the world by trying to change it through social action

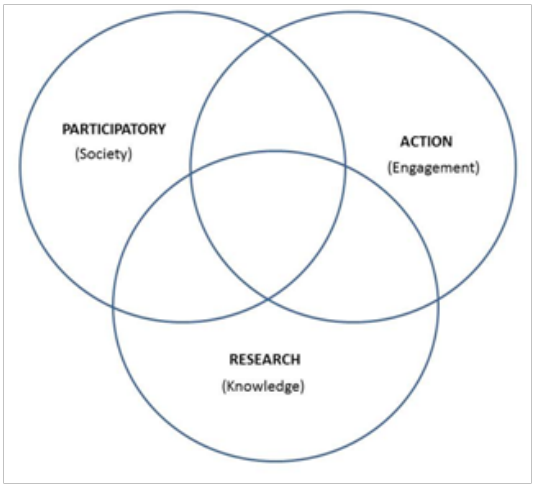

Figure 1. Participatory model of SWM (SAS2 Dialogue)

creating a social change. It emphasizes collective inquiry and experimentation in which "communities of inquiry and action evolve and address questions and issues that are significant for those who participate as co-researchers" (Reason & Bradbury, 2008). PAR practitioners make a concerted effort to integrate three basic aspects of their work. These aspects include the participation (life in society and democracy), action (engagement with experience and history), and research (soundness in thought and the growth of knowledge) (Chevalier and Buckles, 2013). It underpins "action unites with research" and collective processes of self-investigation (Rahman, 2008) as seen in the figure.

The principle of PAR in solid waste management is supported by Menegat (2002), which is translated into "partnerships" among stakeholders by Ahmed (2004) and stressed public participation by Asnani (2006). PAR constitutes a community-based solid waste management initiative (Mongkolnchaiarunya, 2005).

II. METHODOLOGY

Research Design

The study employed a mixed descriptive-qualitative method which includes the

use of interview schedules and focus group discussion among the barangay officials and other stakeholders. Interview schedules consist of garbage characteristics, awareness on the effectiveness of SWM among the residents, recycling and composting practices and their willingness to cooperate in the SWM in their barangay.

Study Locale

Catbalogan City is a newly chartered city located in the capital of western Samar, Philippines. It has 57 barangays, 21 of which are situated in the poblacion (within the center of the city), another 21 barangays are located in coastal areas and 15 are in the interior or upland areas. The problem of Catbalogan in relation to waste management is the deficient system when it comes to upland poblacion barangays of the city. The inaccessibility of the place due to its hilly contour makes garbage collection virtually impossible. The waste management initiative depends upon the local government unit, which due to insufficient funds would also meet an uphill challenge.

The research locale is Barangay 13, one of the 21 poblacion barangays of Catbalogan city and involved 100 household-respondents. The said barangay with a population of 3,483 residents (2007 census) is about 100 meters above sea level. Houses are built on the slopes and plateau area. There are sports and assembly facilities such as the basketball court, barangay hall and day care centers which serve as the venue for gathering and meetings. Data collection was done through interview schedules and focus group discussions with the key officials of the barangay. The intention was to verify the data and come up with a participatory-waste management plan in the said barangay.

Interview Schedules

The structured interview schedules were distributed to randomly chosen 100 households. The components of the instrument included the profile of the respondents, the characteristics of the garbage and their treatment. Recycling and composting practices, response to call of nature, perception of the SWM efforts in their barangay and their willingness to participate to community-based SWM were also included.

Focus Group Discussions

There were two sessions conducted in which one session involved only the Barangay Chairman, the secretary and other barangay officials. The second session was a public forum with the residents of the barangay together with the barangay officials. The latter was conducted in the evening because it is only during nighttime that majority of the residents were present considering that during daytime they were working in the city.

III. RESULTS AND DISCUSSION

The data was taken from the analyzed questionnaires retrieved from Barangay 13, Catbalogan City. Frequency count and percentage analysis were used in processing the data. The survey instrument includes the kinds of garbage, waste disposal practices, sanitary practices, recycling practices and LGU waste collection scheme. Only one member of each household was asked regarding their waste management practices. There were 100 households that were interviewed, and their responses were analyzed and tabulated.

For the housing generated garbage waste, cellophane ranks the highest with 40% followed by kitchen refuse at 25% and plastic bottles at 12 % while paper and

Table 1. Kinds of Garbage and their treatment

Garbage	%	Reuse	Recycle	Just throw after use	Other uses
1. Cellophane (Polyethylene bags)	40%	28	4	3	0
2. Plastic (PET bottles)	12%	20	9	8	3
3. Styrofoam	2%	10	5	19	1
4.Paper, Cardboards	10%	19	8	8	6
5. Metal scraps	1%	14	8	3	5
6. Rubber	3%	15	8	9	1
7. Crystal glass	1%	6	2	17	0
8. Kitchen refuse	25%	0	3	31	0
9. Meat bones, shells, clams	5%	0	4	30	0

Table 2. Method of Waste disposal for non-recycled materials

How do you dispose your garbage?	No. of respondents	Percentage
1. Composting	13	13%
2. Dump in the garbage truck in downtown	37	37%
3. Burning	30	30%
4. Throw in canal	10	10%

Table 3. Response to “Call of Nature”

Do you have a sanitary toilet?	No. of respondents	Percentage
1. No CR	20	20%
2. Homemade toilet (no septic tank)	10	10%
3. Toilet with septic tank	58	58%
4. Public CR or sharing other’s CR	12	12%

cardboards pegged at 10%. Noticeably, these materials are used to wrap the food, as food or drink containers, in which these materials depend on the number of household members. The greater the number of members, the bigger the waste generated (Pothimamaka, 2008). In the treatment of waste, most of the respondents are aware of recycling of still usable materials. For non-usable materials, however, they simply dispose them in the garbage bin. The reason of the respondents for non-recycling practices was the distance from their house to the Material Recovery Facility (MRF). According to some residents it is a waste of time going to MRF, and they can see others also just throwing their garbage in the ground and burn it. The method of their garbage disposal varies from one household to another depending on the proximity of the house to the nearest garbage collection facility.

Composting is practiced by only 13% of the respondents while majority practiced the proper disposal of garbage but about 30% of the respondents still practice the burning of garbage. There were only 10% who answered throwing their garbage in canal streams. On further interview, researchers found out that the collection of garbage is done on designated areas in the city and during collection hours only. They have to wait for the garbage truck to pass by their area so they can place their garbage directly to the truck. If the garbage truck was delayed or has

already passed, some admitted that they just put their bins in a corner and let it rot or wait until it is picked by the truck. Others did the same so a pile of garbage is seen in that downtown area. Uptown, small litters are burned when they sweep the yard and kitchen refuse is thrown to canals together with waste water.

Based on Table 3, 20% of the respondents do not have toilets, so one may wonder how they answer the call of nature. During interview, some admitted that they have to put the waste in a plastic bag and throw it together with the garbage. The area also has some bushes that they can use as "refuge" when nature calls. Majority of the respondents have toilets with septic tank while about 10% do not have a septic tank. This kind of septic tank is usually common in the rural area. It is made up of a hole in the ground, covered with sheets of wood that is built like a box.

Community Material Recovery Facility

The Material Recovery Facility (MRF) of the barangay is made up of steel wire, covered, and has three compartments, that is, Recyclable, Biodegradable, and Non-biodegradable. It is placed in a vacant area about 50 meters from the community. There was a sound maintenance system, but it is not functional. In an interview with an official of the barangay, he said that the council designated some volunteers such as officer and tanod (watchman) to monitor and help clean the facility. However, since there was no remuneration involved, the assigned personnel did not religiously perform their duties. In addition, the personnel complained that the residents do not know how to segregate garbage and do not cooperate with the recycling efforts of the barangay. They just mixed the garbage and place it in any of the three compartments so any assigned person will just consume his whole time segregating the garbage. It turned out, after a day or two, a heaving mixture of garbage was seen in the recovery facility. Further, there was no recycling plant or facility that would collect the reusable materials from the MRF.

Community Forum and Local Government Initiative to Solid Waste Management

Dialogue sessions and focus group discussion were conducted twice involving key officials and residents of the barangay. During the dialogue and forum conducted with the officials and residents of the barangay, they came up with a community-based waste management initiative. An Intra-barangay Cleanliness and Beautification contest will be held annually in the said barangay as part of their plan. To ensure wide participation, Samar State University-College of Education (COED) extension services will

Figure 2. Material Recovery Facility of Barangay 13

Fig. 3 Dialogue with the officials of the Barangay

take charge of overseeing, disseminating through information, education and dissemination (IEC) materials and judging of the cleanliness contest. The operation and maintenance of the MRF will also be managed by the COED extension services until such time that a recycling facility will be tapped for its continuous operation. To ensure success of the program, the residents promised to cooperate in the said beautification contest activity and waste management scheme and will be vigilant of the activities of their neighbors. On the part of the barangay council, they will help in disseminating the program and will impose a more stringent measure to the violators. Indeed, the success of the SWM program depends on the public participation (Ahmed and Ali, 2004; Asnani, 2006; Menegat, 2002; Mongkolnchaiarunya, 2005) and a "strong community and concerned officers" (Pothimamaka 2008; Stave, 2010).

Residents of the barangay view the current waste management as ineffective due to lack of funds, absence of strong policy on waste segregation and inadequate recycling facilities in the area. These reasons hinder the success of an SWM effort (Mongkolnchaiarunya, 2005; Nringeye and Omortor, 2010; Ballados, 2010; Tukahirwa, et.al., 2010).

Majority (71%) of the respondents are willing to participate in the community-based SWM in the barangay. There were those, however, who are reluctant to implement a new SWM scheme considering that a penalty will be imposed if they will violate the program. The thought of paying the penalty is what they worry more. For the 14% of the respondents, they prefer not to be involved in the decision and just play passive. They tend "not to be serious" about the SWM because "it is still happening and will always be there". This observation appends in consonance with the observation in other communities in the Philippines (Macawile and Su, 2009; Ballados, 2010). Filipinos value cleanliness and have strong desire to participate in the solution of waste problems but the action and implementation must come from the iron hand of the government and strong will of the officials.

IV. CONCLUSION AND RECOMMENDATIONS

The problem of solid waste in Barangay 13 is due to the lack of strong waste management system and wide participation of the stakeholders involved. There is no functional waste collection scheme in the barangay. The barangay unit has no clear policy on waste management which is aggravated with the lack of awareness in recycling and composting processes by the residents.

Solid wastes are inevitable, but strong implementation of policies can reduce this garbage into categories that will be still useful to others. As found out in the investigation, most of the wastes generated are the polyethylene bags, plastic wrappers, and candy litters. These wastes are containers of daily commodities and therefore reusable. Public information about waste recycling efforts, massive awareness campaign about the benefits and advantages are the starting option (Niringeye and Omortor, 2010). Planning what SWM model best fits the barangay and consultation with the stakeholders are inevitable (Hostovsky, 2006). The university through the COED extension services can help facilitate and help promote the program through community-wide programs that would encourage participation and action.

Cutting the source or banning the use of polyethylene bag is another option. In other cities, they already banned the use of plastic bags. Malls asked for payment if you will ask for a plastic bag. Candy wrappers should be substituted with

biodegradable plastics. The production of plastic should be regulated and the use of biodegradable materials should be recommended. Barangay units must be stringent on the policies of recycling and composting.

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