STUDY OF HOUSEHOLD WASTE MANAGEMENT IN BANDUNG, INDONESIA

Mifta Ardianti Safitri1, Takeshi Fujiwara1, Mohamad Chaerul 2, and Enri Damanhuri2

1) Grad. School of Environmental and Life Science, Okayama University, 2) Dept. of Environmental Engineering, Institute of Technology, Bandung

1. Introduction

Rapid population growth in Bandung, Indonesia, has posed serious challenge, especially for solid waste management (SWM) in urban areas. Bandung is using a major landfill located 46 km from the city center and having disposal capacity 1,800 – 2,200 m3/day (BPLHD, 2008). As the landfill capacity decrease over time, the government reorganized the importance of SWM. SWM in Indonesia usually relates to both formal and informal sectors (Sembiring, 2010). In Bandung, City Clean Agencies and formal sectors are registered, whereas, informal sectors acted as individual, group, small business, are not. At the beginning of SWM, the sectors in primary phase are responsible for the generation, collection, storage, and transportation of domestic solid waste (Aprilia, 2012). Behavior and opinions of these actors give important influence towards MSW policies. Currently, strategies to minimize waste through 3R have been performed by City Clean Agency (Haikal, 2012). Waste separation and segregation is the initial step to minimize the waste, depending on household’s conscious to participation.

This study aimed to understanding Bandung citizens’ awareness and behavior of household waste separation and segregation, as well as their willingness to do. Also identify characteristic of household solid waste generation and composition of Bandung.

2. Methods

2.1 Sampling Method

The questionnaire survey was conducted to examine household waste management attitude, behavior, and motivation. On the other hand, household waste generation survey was conducted to examine physical composition of household waste generation. Both surveys were carried out in August 2013 in Bandung. Questionnaires were distributed using random stratified method based on the economic condition of the households in the community, and total of 199 responses were used for data analyses. As for household waste generation survey, 10 households were selected in Cibeunying sub-district. They were requested to hand over their household waste for 14 days consecutively. We separate the waste into several categories, weight the waste, and record them every day.

2.2 Data Collection

A structure of questionnaire we developed consisted of four sections: socio-economic information of the households, waste management attitude, household behavior towards specific waste, and also household motivation towards 3R. The data obtained from questionnaire were processed by computer using the SPSS 22 statistical package.

3. RESULTS AND DISCUSSIONS

3.1 Profile of Participants

The population in this survey consisted of household members who live in Bandung within 13 sub-districts out of 23 sub-districts. The demographic information shows that study’s samples consist of more women (50.8%) than men (49.2%). In terms of their occupation, 30.9% of the respondents are entrepreneur and 29.9% of them are housewives. The monthly household incomes range shows that 6.1% have the income less than $ 131.2, 37.4% between $ 131.3 - $ 377.2, 29.8% between $ 377.3 - $ 623.2, 17.7% between $ 623.2 - $ 869.2, 4.5% between $ 869.3 - $ 1230, 1% between $ 1230.1 - $ 1640, and 3.5% more than $ 1640,1. As for family size, most respondent living in a family consists of average 4 member (27.4%), and 20.8% of them living in a family more than 5 members.

3.2 Waste Management Attitude

Municipal Bandung adopts a waste management system that has collaboration between informal sector and local authorities to manage the municipal waste. Local authorities start to collect the waste and transport to landfill from transfer points in each area. Informal sector was introduced into this system to collect the waste from the sources. Based from survey, 73.4% of the respondents give their household waste to informal waste picker, 17.6% dump their waste to the nearest dumpster. In term of household attitude in dispose waste, 63.8% of the respondents do not segregate their household waste, the frequency for disposing household waste 40.8% of them dispose their waste three times in a week.

3.3 Household Behavior towards Specific Waste

Figure 1 Household Solid Waste Composition

3% 1% 2% 2%
10%
15%
67%
Organic
Paper
Plastic
Glass
Metal
PET

corresponding author: Mifta Ardianti, Graduate School of Environmental and Life Science, 3-1-1 Tsushima-naka, Kita-ku, Okayama-city, Japan, 700-8530. Tel : 086-251-8994 FAX : 086-251-8994 e-mail : mifta_ardianti@hotmail.com

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Undoubtedly, informal sectors in Bandung are giving great influence on recyclable material recovery. The most widely sold recyclable wastes are PET, paper, and plastic waste, so we asked respondents about their behavior in disposing and utilizing of these kinds of waste. The study about PET bottle waste resulted, respondents who keep the PET only 35.2% but 49.2% do not reuse this waste for personal use. On the other hand, respondents throw the PET immediately is 35.7% and 43.2% of them dispose PET to informal waste picker.

As for paper waste, 51.8% of the respondents keep the paper waste, 59.3% of respondents do not throw the paper waste to trash bin, they reuse the paper waste (34.7%), 40.4% of them agree to sell the paper waste to junkmen.

And for plastic waste, 53.3% of them never bring their own shopping bag when they go shopping, 65.3% of them always accept the plastic bag from store. But 50.3% of them not throw the plastic immediately and 60.3% of them said that they keep and reuse the plastic for home use.

According to data given by Damanhuri (2010), Bandung waste generation composition shows high content in organic waste (73.4%), Paper (9.7%), plastic/rubber (8.6%), textile (1.3%), metals (0.5%), glass (0.4%), and others (6.1%). When we compare these values with our result from household waste generation survey (Figure 1) the component values are quite similar.

Household waste that has been generated by respondents is shown in Figure 2, increased day by day. Waste generation survey result was 0.35 kg/cap/day, fits with the standard of waste generation for permanent house 0.35 – 0.4 kg/cap/day (Damanhuri, 2010).

3.3 Correlation

Table 1 shows inter-correlation between items. Gender and area where participants live shows negative correlation in waste segregation action and participation. This shows that being a person who has major responsibility in household waste management does not show any relation in waste segregation both action and participation.

Questionnaire result reported that participants tend to have high participation in waste management, especially 3R.

4. CONCLUSION

Studies carried out in Bandung to find out the household waste generation, composition, participant’s waste management attitude, behavior, and motivation. According to waste generation survey it was found out that the waste composition high amount of organic waste (67%), moderate amount of paper (15%) and plastic (10%), and low amount of glass (3%), metal (1%), PET (2%), and others (2%). Mostly residents dispose their household waste then being picked by informal waste picker (73%). Even though many residents do not segregate their household waste (63.8%), their willingness to participate in waste segregation and also 3R action is very high. Inter correlation of items between two surveys showed that occupation, income, family size affected in household waste segregation activity.

As our suggestions, in order to control municipal waste management, aside mandatory law from government policy, an educational program should be given to resident continuously, preferably from early age to enhancing environmental attitude. To meet the public interest, provision of facilities that support 3R actions is need to be developed.

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