Household waste management in Sukoharjo Village, Ngaglik District, Sleman Regency, Yogyakarta Special Region

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Abstract. Waste is an item that is considered to be unused and disposed of by the previous owner/user, but actually from the dumped part of the waste it can still be used if managed with the right procedure. The problem faced today is handling waste without going through the right management process. The community disposed of all the waste produced through the officers, buried in the garden or disposed of it wildly. This is found in Sleman Regency in general and in Sukoharjo Village specifically. This study aims to find out the characteristics of the waste management community in Sukoharjo Village; explain waste management in Sukoharjo Village; and examine the differences in waste management by the community in Sukoharjo Indah Housing with Banjarsari Hamlet. The method used in this study is a survey method. Survey is an investigation by using questionnaires for collecting data. Data collection was carried out by observation and interview of 76 respondents. The results, waste management model differences in the two regions due to the differences in household characteristics, such as income level and the land ownership to burn trash. On the other hand, the trash also requires management to avoid direct way disposed to landfill, by making use reduction, reuse, and recycling. However, waste management in both areas is reach the phase of reduction. This is due to the lack of socialization of waste management in the two regions, especially in Banjarsari Hamlet RT 06 surveyed had never held socialization.

1. Introduction

Waste are objects or residual products in solid form as a result of human activities, which are considered useless and undesirable by their owners and disposed as an useless objects [1]. Based on data from the National Urban Strategy in 2003, in one day metropolitan city like Jakarta managed to accumulate 5000 tons of garbage from the 10 million population. The total potential waste in Indonesia has reached 100,000 tons per day.

Sleman Regency can produce up to 800 tons garbage per day. Most of them are household waste. That's was conveyed by the Head of UPT Waste Management Sleman, Sri Restuti Nur Hidayah after the commemoration of the National Solid Waste Day 2019 in Krikilan Hamlet, Tegalrejo, berbah. She stated on Friday (08/03/2019) that: “One person can produce 0.65 up to 0.7 kg of waste per day. She also stated that from 800 ton waste which produced by the household, DLH Sleman can only manage 52% of it. Meanwhile, 32.5% of the total waste is taken to TPA Piyungan [2].
The waste problem is also experienced by Sukoharjo Village, Ngaglik District, Sleman Regency. So on Saturday, January 19, 2019, the Sukoharjo Village Government provided training on waste management. In this activity with the guest speaker Mr. Sutarjo as Manager of the Bramamudha Dayakan TPS Sardonoharjo, Sutarjo conveyed knowledge about how to set up a waste bank, as well as training on how to process and separate waste. This event, held in the Hall Village Sukoharjo 1:20 pm - 3:30 pm and was followed by two other Dusun that is Losari and Banjarsari, people who took this training is very enthusiastic in listening to the material given by the resource [3]. As explained above that waste has been increasing everyday, but the waste management can not be done because of lack of knowledge and ignorance of society. Cause of the limitation in knowledge, makes the community throw away garbage using plastic bag without any effort to sort or reuse that items, even its can still be used. The public indifference shown by the people who throw rubbish illegally on the river bank, river bodies, roadsides, people’s yards and on neglected lands. Waste that is not managed properly can have several impacts including disrupting aesthetics, polluting the soil and ground water, polluting the waters, causing floods, causing foul odors, and sources of germs [4]. Bearing this in mind, it is necessary to conduct research on Household Waste Management in Sukoharjo Village.

The purpose of this research are 1) to know the characteristics of the community of waste managers in Sukoharjo Village, 2) to explain waste management in Sukoharjo Village, and 3) to examine the differences in waste management by the community in Sukoharjo Indah Housing and Banjarsari Hamlet.

2. Methodology
2.1. Research location
The location chosen to conduct this research is Sukoharjo village, Ngaglik District, Sleman Regency, Special Region of Yogyakarta.

The choice of location in this study was carried out with consideration of the suitability of the research topic with the currently developing phenomenon. Sukoharjo Village is one of the villages in Ngaglik which has experienced rapid development marked by the construction of settlements, boarding houses and trade facilities in the area. The existence of settlements, boarding houses and trade facilities causes waste management problems, there are some people who littering, for example in rivers, on the roadside, and in people's yards. Of course this is very disturbing so that the people in these locations give warnings by installing banners that contain sanctions for those who throw garbage in these locations.

Considering the number of RTs (Neighborhood Associations) and RWs (Citizens Associations) in the village of Sukoharjo, the selection of research locations uses a sampling area [5]. This considers the aspects of cost, time and energy. The chosen ones are Banjarsari Hamlet RT 6 RW 12 and Sukoharjo Indah Housing RT 10 RW 14 (see Figure 2).

2.2. Sample selection
In an effort to find out the characteristics of the community in the Banjarsari Hamlet RT 6 RW (Citizens Association) 12 and Sukoharjo Indah Housing RT 10 RW 14, all household heads or those entitled to represent are chosen as respondents (census). The number of respondents in Banjarsari Hamlet RT 6 RW 12 is 45 people and the number of respondents in Sukoharjo Indah Housing RT 10 RW 14 is 31 people.

2.3. Method
The method used in this study is a survey method. The survey method is a research method that aims to collect a large number of variables regarding a large number of individuals through interview measuring tools [6]. A survey is an investigation carried out to obtain facts from the phenomena that exist and look for factual information, both about the social, economic, political institutions of a group or region and this can be conducted by census or using a sample [7]. Survey is an investigation by using questionnaires for collecting data [8].
Data collection is carried out by conducting direct surveys in the field. Data collection techniques can be done with the process of observation and interviews (using questionnaire). In an effort to facilitate data input, the database was created using File Maker software version 9 [9]. This was done because the File Maker software made it easy for users to create databases using the same format as the questionnaire. Then the database was analyzed with the Statistical Package for the Social Sciences (SPSS) program using frequency and cross tabulation techniques [10].

3. Result
As explained in the research location and sample selection, the study was conducted in the village of Sukoharjo considering there are many Dusun (hamlet), RT and RW, then selected villages and housing that are supposed to represent. Selected Dusun is Banjarsari Hamlet RT 06 / RW 12 and selected housing is Sukoharjo Indah housing RT 10 / RW 14, the selected location shown in image number 1 and total respondents drawn 76 (59.2%). The number of respondents in the Banjarsari Hamlet is 45 and the number of respondents in Sukoharjo Indah Housing was 31 (40.8%). The number of respondents in the Banjarsari Hamlet and Sukoharjo Indah Housing can be seen in Table 1 or Figure 1.

Table 1. Number of respondents in Banjarsari Hamlet and Sukoharjo Indah Housing.

| Locations                  | Frequency | Percentage |
|----------------------------|-----------|------------|
| Banjarsari Hamlet          | 45        | 59.2       |
| Sukoharjo Indah housing    | 31        | 40.8       |
| Total                      | 76        | 100.0      |

Figure 1. Proportion of respondents.
Figure 2. Banjarsari Hamlet RT 06 / RW 12 and Sukoharjo Indah Housing RT 10/RW 16
3.1. Community characteristics

There are six characteristics of the community in Sukoharjo Village represented by respondents in the Banjarsari Hamlet and Sukoharjo Indah Housing as follows:

3.1.1. Gender. Data by gender in Banjarsari Hamlet nearly balanced between the number of respondents who androgynous men and women, namely 23 (51%) and 22 (49%). Meanwhile, respondents in Sukoharjo Indah Housing dominated by women 27 (87%), the remaining 4 (13%) respondents gender male. Gender of respondents in Banjarsari Hamlet and Sukoharjo Indah Housing in detail can be seen in Figure 3.

![Gender of respondents](image)

**Figure 3.** Gender of respondents.

3.1.2. Age. The age of respondents is very varied, youngest respondents aged 25 and the oldest 72 years old. The average age of respondents was 53 years. Respondents were aged between 25-29 years is the age group most lower the frequency of only 2 (2.6%). The respondents were aged between 60-64 are the most respondents, is 17 people (22.4%). If further examination, the majority of respondents included the productive age group of 63 people (82.9%). The remaining 13 respondents (17.1%) included in the productive age group. Table 2 shows the class age of the respondents as follows:

**Table 2.** Class age of respondents.
| Age group | Frequency | Percentage |
|-----------|-----------|------------|
| 25-64     | 63        | 82.9       |
| >= 65     | 13        | 17.1       |
| Total     | 76        | 100.0      |

3.1.3. Education. Based on the results of the survey, respondents' education varies widely, ranging from no school or not graduate until it reaches the post-graduate education. Respondents are not in school or not graduate consisted of six people (7.9%) from Banjarsari Hamlet. However, most respondents are graduates SLTs / SMA, i.e. as many as 29 people (38.2%) and graduate as many as 21 people (27.6%). Respondents who studied at the college (diploma, undergraduate and postgraduate) as many as 32 people (42.1%). This indicates that most respondents in Banjarsari Hamlet and Sukoharjo Indah Housing have the ability to field a good education. Last educational distribution of respondents in Banjarsari Hamlet and Sukoharjo Indah Housing in detail can be seen in Table 3.

Table 3. Last education distribution of respondents and housing in the Banjarsari Hamlet Sukoharjo Indah.

| Locations          | Education of Respondents | No School / no pass SD | Pass Junior / Junior | Graduated high school / high school | Diploma I / II / III | Bachelor | Postgraduate | Total |
|--------------------|---------------------------|------------------------|----------------------|--------------------------------------|----------------------|----------|--------------|-------|
| Banjarsari Hamlet  | Frequency                 | 6                      | 7                    | 21                                   | 2                    | 7        | 2            | 45    |
| % Of Total         |                           | 7.9%                   | 9.2%                 | 27.6%                                | 2.6%                 | 9.2%     | 2.6%         | 59.2% |
| Sukoharjo Indah Housing | Frequency | 0                      | 2                    | 8                                    | 5                    | 14       | 2            | 31    |
| % Of Total         |                           | 0.0%                   | 2.6%                 | 10.5%                                | 6.6%                 | 18.4%    | 2.6%         | 40.8% |
| Total              | Frequency                 | 6                      | 9                    | 29                                   | 7                    | 21       | 4            | 76    |
| % Of Total         |                           | 7.9%                   | 11.8%                | 38.2%                                | 9.2%                 | 27.6%    | 5.3%         | 100.0%|

3.1.4. Occupation. Respondent’s job divided into civil servants, military / armed forces / police, private employees / employees, the commerce / self, farmer, labor, retirement, and other work. The number of respondents with at least the type of work is Military / Armed Forces / Police namely 1 (1.3%). While most respondents have other types of employment (Non PNS Teacher, Kindergarten Teacher, Housewife and Handyman) is 35 people (46.05%). Works of respondents residing in the Banjarsari Hamlet quite varied, while respondents residing in Sukoharjo Indah Housing consists of workers civil servants, private employees / Employees, Retirement, and other workers. Other work can be as Lecturer, Kindergarten Teacher, Teacher Non PNS, Housewife, and Plumbers. However, overall for other types of work, both respondents who lived in the Banjarsari hamlet and Sukoharjo Housing predominantly worked as housewives, namely 17 (22.4%) and 12 (15.8%) respondents respectively. Details of the occupation in Banjarsari Hamlet and Sukoharjo Indah Housing distribution can be seen in Figure 4.
3.1.5. *Income*. The level of income per month of respondents were classified into five, namely <Rp 500,000.00; Rp 500,000.00 - Rp 2,500,000.00; Rp 2,500,000.00 - Rp 5,000,000.00; Rp 5,000,000.00 - Rp 10,000,000.00; and > Rp 10,000,000.00. The most dominant revenue obtained by the respondents, both residing in the Banjarsari Hamlet and Sukoharjo Indah Housing is Rp 500,000.00 up to Rp 2,500,000.00. Respondents who earn those income by the nominal range is 48 people (63.2%). Respondents who had a revenue of Rp 2,500,000.00 - Rp 5,000,000.00, which is 21 people (27.6%). The respondents who have an income <Rp 500,000.00 as many as four people (5.3%). Respondents who had incomes > Rp 10,000,000.00 only 1 (1.3%). Details of the income distribution can be seen in Table 4.

Table 4. Distribution of income of respondents in Banjarsari Hamlet and Sukoharjo Indah Housing.

| Income of Respondent | Location         | Frequency | % from Total | Total |
|----------------------|------------------|-----------|--------------|-------|
|                      | Location         | Banjarsari Hamlet | Sukoharjo Indah |
| < Rp 500,000         | 3                | 1          | 4            |
| Rp 500,000 - 2,500,000 | 27               | 21         | 48           |
| Rp 2,500,000 - 5,000,000 | 15               | 6          | 21           |
| Rp 5,000,000 - 10,000,000 | 0                | 2          | 2            |
| > Rp 10,000,000      | 0                | 1          | 1            |

3.1.6. *Number of household members*. The majority of respondents living in Banjarsari Hamlet have 3-4 family members (56%). While the majority of respondents living in Sukoharjo Indah Housing have a family member of 1-2 people (36%). This shows that those living in the house are only parents, while their children go overseas to work in other cities. Details of the data distribution can be seen in Figure 5.
3.2. Waste Management

Waste management is a step taken to resolve the garbage problem. Household waste management is a systematic, comprehensive and sustainable which includes the reduction and treatment of household waste [11]. Waste management includes technical and non-technical measures, including how to organize, finance, and involving the community in the waste generator to be able to participate in the activities of waste management. Optimization of waste management will be successful if preceded by sorting level [12].

Trash largely sourced from households. Therefore, it is necessary for active community involvement in managing the waste, so its not constantly end up in landfills. The source of waste is the origin of the waste generation. In this case, the source of waste is from households. In this study, the authors identify whether the daily activities in the household is the main source of the waste or not. Nearly 100 percent of respondents overall assume that household activities are the main source of garbage it produces.

Household activities which become the main source of rubbish shows that every house should ideally have a trash bin/trashcan. This avoids the garbage strewn conditions and may interfere with the aesthetics and cleanliness of the surrounding residential neighborhood. Nearly 100 percent of households in the Banjarsari hamlet and Sukoharjo housing estate have trash bin. There are only two houses that do not have a trash bins. This indicates that the population in the Banjarsari Hamlet and Sukoharjo Indah Housing own awareness of environmental hygiene and not littering the surrounding. Based on the location of the trash bins, most households in the Banjarsari Hamlet have trash bin are placed in the house. While most households in Sukoharjo Indah Housing have bins that placed inside and outside the house.

The trash bin is a container for the disposal of waste generated from household activities. The trash bin in the household can use baskets, buckets, barrel, plastic bags or other containers. Residents in Banjarsari Hamlet mostly using barrel as garbage disposal container. While residents in Sukoharjo Indah Housing most of them use plastic bags as garbage disposal container. The trash is essentially divided into trash bin closed and open. The results of the field survey shows that most of the trash bin that the household is in an open condition or does not have a lid. The trash bin that does not have a lid generally not recommended to be placed inside the house. This is because these conditions will bring up the odor and attracts dirty animal such as rat and fly. This condition is likely to impact the environmental conditions around the room, such as food.

This kind of waste generally consists of organic and inorganic waste. Organic waste is waste that comes from living things and is easily biodegradable. While inorganic waste is waste that difficult to decompose naturally. A total of 36.8 percent more households produce organics waste, 44.7 percent of
households produce more types of inorganic waste, and 18.4 percent of households produce organic and inorganic waste in large quantities of the same. Overall, households produce more inorganic waste. Waste weight shows how much waste is generated by households. Heavy trash is calculated in units of kilograms. Waste weight is divided into 3 classification ranges, namely <0.5 kilogram; 0.5 - 1 kilogram; and > 1 kilogram. Of the total 76 households, 75 percent produce less than 0.5 kilograms of waste per day, 18.4 percent produce 0.5-1 kilograms of waste per day, and 6.6 percent produce more than 1 kilogram of waste per day. Households that produce waste more than 1 kilogram per day generally are households that have a particular shop or business in their home.

3.3. Differences Waste Management
Managing waste requires the role of household members so that it can be carried out properly. Waste management at household level can be played by the husband, wife, children, servants, or other family members. Overall household respondents in this study, waste management more dominant played by a wife. Results if the data indicate the role of a wife in household waste management amounted to 56.6 percent. This is because a wife is usually more often at home, because most wives in each household in the study area are housewife.

Waste management can be done in various ways, including restrictions on the quantity (reduce), reuse (reuse) and recycling of waste (recycle). Overall household waste management is most often done is a limitation of quantity (reduce). Households in the region have not been able to do most of the recycling bins, especially for plastic garbage. This indicates that Banjarsari Hamlet and Sukoharjo Indah Housing need to be introduced regarding how to manage waste more effective, either by recycling garbage.

Handling waste has a variety of ways, including discarded in the garden, burn, left, thrown into rivers, collected, or reprocessed. Handling waste by households in Sukoharjo Indah Housing usually is collected. This is evidenced from the results if the data shows that 57.3 percent of households that make the handling of waste everyday by collecting it.

Some existing household need a service from garbage worker in disposing their household waste. In general, households who use this service is household whose don’t have their own land to manage their waste. There is a significant difference between households in the Banjarsari Hamlet with households in Sukoharjo Indah Housing. In the amount of 42.1 percent households in Banjarsari Hamlet do not use the services of garbage worker, because the majority of households have their own land to burn garbage every day. This condition is also caused by a relatively small income that these households can not afford to pay for garbage worker. Different from the households in Sukoharjo Indah Housing, almost 100 percent of households use the services of garbage worker. Its, happened because they do not have land to burn the garbage. In addition, the residential population has better economic ability to be able to pay for services garbage worker.

Garbage collection by a garbage worker performed periodically. Waste transported out of the house in the Banjarsari Hamlet about 3 times a week. Meanwhile in Sukoharjo Indah Housing its happens, every day except on holidays. Based on the interview, households in the Banjarsari Hamlet and Sukoharjo Indah Housing using the services of garbage worker must pay for services by Rp 35,000 each month.

Households that do not have land to burn garbage will certainly depend on garbage workers. However, not infrequently officers did not take the garbage on time. If these conditions occur, the majority of households in the Banjarsari Hamlet who use the services officer will burn the garbage. However, some households in Sukoharjo Indah Housing choose to let garbage bins in the yard of the house until the time taken by a garbage worker or throw it into someone else’s lawn. Garbage taken by officers and then there is the possibility of being discharged directly into the landfill, but there is also the possibility of not dumped directly into landfill. Most respondents in this study assumes that the garbage is taken from every household be disposed of to landfill. However, some households also assumes that the garbage is not disposed to landfill. All households in the Banjarsari Hamlet who use the services of garbage worker does not know the location of the landfill. However, some households in
Sukoharjo Indah Housing know the location of the landfill. The location where landfill by garbage worker is in TPA Piyungan.

Trash is basically a consequence of the activity or activities of the population, especially households. However, on the other hand people should preserve the environment to avoid contamination and environmental damage. If waste can be managed properly, then the actual garbage is not a serious problem. However, to be able to manage it properly, it is necessary to have an introduction to the public on waste management. The introduction can be done through the dissemination of waste management institutions to the public. Interviews showed that, it had never been socialized in Banjarsari Hamlet waste management. Housing conditions differ with Sukoharjo, several residents attended socialization waste management ever held by the NGO / Specialist / Expert Trash and Government. The type of socialization that is done is about skills and how to manage waste properly. In addition to socialization, the shape of the program ever held several parties are in form of waste management. However, in the Banjarsari hamlet the program has never been touched. While several households in Sukoharjo Housing have received assistance in the form of waste management, such as barrels for garbage bins.

Independent waste management can be used as an alternative to overcome the problems of garbage, one example of a village that has implemented independent waste management is Sukunan Village, Banyuraden, Gamping, Sleman. It begins with the problem of waste management, people had difficulties in throwing garbage due to distance of TPS from the Sukunan Village. Iswanto Noto is the originator of independent waste management in the village [13]. He changed society’s perspective of trash, from throwing it up to processing it, it takes time, effort, expense and power. Waste management activities undertaken would be optimal if the Government, communities and companies work together so that waste management can be optimally [14]. Thus people can also acquire knowledge, insight even enough assistance from the government related to waste management. Another study in Banyuwangi [14] concluded that the waste problem will occur along with the increase of population. One of the measures implemented to overcome these problems is through the use of waste can have an economic value.

4. Conclusions
Characteristics of the residents in Sukoharjo Indah Housing are better than the residents in Banjarsari Hamlet. Almost all households in the Banjarsari Hamlet and Sukoharjo Indah Housing have bins that placed inside or outside the house. How to handle household waste are generally different. Most residents of the Banjarsari Hamlet burning their waste. While the residents of Sukoharjo Indah Housing use the services of garbage worker to disposed the waste to landfill. Waste management model differences in the two locations due to the differences in household characteristics, such as income level and the land ownership to burn trash. On the other hand, the trash also requires management to avoid direct way disposed to landfill, by making use reduction, reuse, and recycling. However, waste management in both areas is reach the phase of reduction. This is due to the lack of socialization of waste management in the two regions, especially in Banjarsari Hamlet RT 06 surveyed had never held socialization. Although it has been mentioned [3] that Banjarsari Hamlet attended the training of waste management.

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