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Design of Garbage Disposal Flow on Jalan Petir Tasikmalaya

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Abstract: The purpose of the study was to analysis the use of design of garbage disposal flow on jalan Petir Tasikmalaya. Accumulation of waste or garbage that occurs in Indonesia, especially in densely populated areas is still a problem that should be taken seriously. Garbage that is scattered everywhere, including in ditches, occurs because of the lack of public understanding of environmental conservation and the poor quality of waste management. This study aims to find an approach related to waste reduction and management solutions on Jalan Petir, Tawang, Tasikmalaya so that they are not scattered and clog drainage around, especially ditches that channel along densely populated roads. The research was conducted using survey methods and qualitative analysis so that it resulted in the design of the waste disposal flow. As a solution to the problem of accumulated garbage, this design focuses on the human aspect as the coordinator of this flow as well as aspects of the waste sorting process where waste is classified into 3 categories, namely organic, B3 and inorganic. In this flow, the waste is coordinated from the household and there are two sorts of waste. The first stage of the waste classification process is carried out at home and then continued at the waste sorting site as the second stage. The end of this flow is the process of disposing of waste that is classified as B3 waste and inorganic residue that is in a temporary shelter and is taken to a final disposal site. The design of this flow can be implemented with cooperation between the community, government, and local businesses.

Keywords: flow, sorting, management, garbage

INTRODUCTION

The massive amount of Indonesian population causing huge amount of waste volume. Moreover, the consumptive behavior of Indonesian people highly contributes in generating more variation of waste (Jannah, 2020), one of them is plastic waste that hazardous and difficult to decompose by nature. Garbage or waste is one of the main problems that occurs in Jalan Petir Tasikmalaya. There are numerous boarding house and local mini store along the street that produce high amount of garbage.

In recent years, a lot of research studies and papers have been done to specify useful and influential factors affecting waste management system in cities of developing countries. Zohoori, M., & Ghani, A. (2017). Moreover, Vassanadumrongdee & Kittipongvises (2018) stated that solid waste is one of the challenging environmental issues in developing countries, especially in urban areas. In Petir street, people tend to throw their garbage into the ditches along the road. This kind of action, if not solved as soon as possible, will cause the ditches to be clogged, and potentially become flood.

Most of the people in Petir street perceive waste only as useless things. They did not view it as a potential resource that can be useful. In managing the garbage, people are still using the *end-of-pipe approach* where waste is collected, carried, and thrown away at the end site of waste (Septiani, et. al., 2021). The huge pile of waste in this end site could potentially release methane gas (CH_4) that could increase greenhouse gas emission (Indawati, 2020) and causing a big effect to global warming.

Therefore, there is a need to design a more specific disposal flow to avoid a terrible complication caused by waste dump. Beside the more specific design of disposal flow, people in Petir street should also understand the importance of preserving the environment in their neighborhood. This could be done by increasing the literacy of the people by setting up training and workshop that held routinely. People also should work together to adapt with discipline in disposing their waste.

METHOD

This study was done by using survey method and implementing qualitative analysis. These methods draw systematically and factually the actual condition. The data were collected using observation and interview in the form of pictures, videos, documents, and opinions (Prambudi, 2019). This method is effective in obtaining the qualitative data that comes directly from the problems. The data were accurate and actual.

Survey method was used to gain factual information on how the waste management and the flow of waste were done in Petir street. The factual information was gained through this method become the base information to find out the main reason of the problem. Moreover, the factual

information was also used to analyze the gap in order to design the solution of the problems in the street.

Data collection was done by concerning three categories of qualitative mode which are primary data, secondary data, and tertial data. Primary data is a data that is experienced, known, and observed directly. This data taken by seeing it or feel it directly and also by interviewing the related parties. (Prambudi, 2019). In this research, the data was taken directly by observing the condition of the drainage of Petir street and interview with the people around the street.

As a supporting data in developing a solution of the problem, the secondary data was obtained from previous research such as articles and journals related to waste management and flow. These data are analyzed and cited for scientific research or any other purposes (Prambudi, 2019) like the arrangement of the flow design for this study. To complete the process of designing the flow, tertial data in the form of maps derived from Google Maps apps of Petir Street was taken and used to complete the primary and secondary data. These data was used to illustrate the design of flow of waste management so that it can clearly visualize the whole process and the appointed location.

RESULTS AND DISCUSSION

Results

Based on the survey, it was obvious that people in Petir Street still throw their garbage to the ditches causing the drainage clogged. It can be seen in the picture 1 that there are a lot of garbage blocking the flow of the water in some area of the bridge. When the rain falls, the water level will increase and produce unpleasant smell from the trapped garbage. This situation will affect people's activities. Thus, this problem should be handled immediately to prevent worse scenario. Shown in the picture 1 that describe the clogging caused by trash.

Picture 1. Trash that clogging the ditches in Petir Street

People in Petir Street did not understand the aftereffect of littering. This kind of habit was done because of the lack of awareness on environment pollution and also culture of littering that

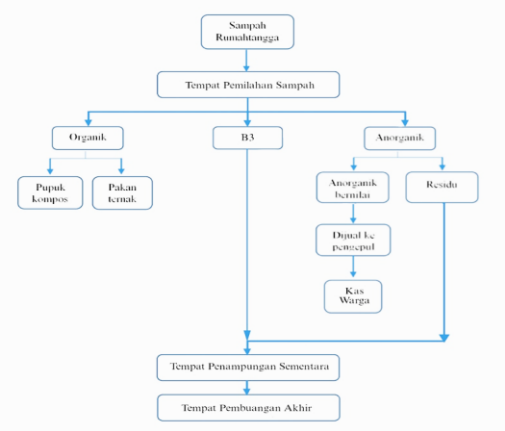
has become a habitual action (Nim, 2015). Based on the survey, there are no trash bin for the pedestrian in Petir street and the temporary garbage site is 600 m away from the street. This condition enhances the possibility for people in littering.

Discussion: Design Concept

Based on the problems exploration on massive littering activities, this issue is related with the flow that makes people find it hard to implement good attitude in managing waste such as throwing garbage in the proper place. Design can change people's behavior. With a proper design, people's mindset can be changed to form a good new habit. Therefore, there is a need for solution in designing the waste flow to form a good habit.

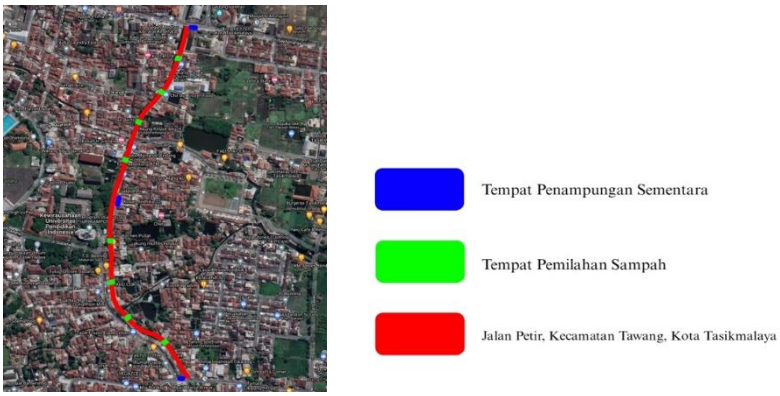
This study offers a new design of flow waste management for Petir street by using flowchart and visualization of the rubbish bin places with map. The design concept of this flow can decrease the laziness level of the people. The implementation of this flow waste management needs the contribution of the people around the street to start and applied the design from the smallest level (home) to the process of transfer by garbage man.

In this design, the first step of the flow started from the waste that produced by every house around the street. The waste should be sorted out and divided into organic waste, nonorganic waste, and hazardous waste. This sorting place should be placed in every 80 meters along Petir Street as shown in picture 2, so that every pedestrian and people around the street have no reason to throw the garbage to the ditch. The next step as shown in the chart 1, is sorting out the waste again classifying which waste that can be processed as fertilizer or any other useful form from organic and nonorganic waste. After sorting out the waste, the volume of the waste will shrink when transferred to the temporary waste site by the garbage man. This process can decrease nature damage that caused by the pilling waste at the end site. The last step of this flow is transferring the rest of the garbage to the end site. Shown in the picture 2 that describe the design flow waste management.



Picture 2. Plan chart of the design flow waste management

The planned garbage sorting place in Petir Street which has a ±800m long is shown in Picture 3. There is a rubbish bin provided to accommodate people who wants to put their garbage in every 80 m. The temporary waste site is located in every end of the road and in the middle of the road. This strategy is developed to ease people in transferring the garbage from the sorting site in a simple manner. Shown in the picture 2 that describe the plan map of sorting site in Petir Street



Picture 3. Plan map of sorting site in Petir Street

CONCLUSION

Waste from people's activities tend to increase and varied from time to time. The volume of the waste in Indonesia is 26,19 million ton per year with domestic waste plays its role as the biggest contributor. As a result, waste management become a huge issue due to the poor management. Mindset, behavior, and culture of ignoring the management of the waste flow has created a social, and health problem in the society (Indrawati, 2011).

With the design of garbage flow management, there is a chance to decrease the huge amount of waste in the temporary waste site and environment damage that occur around the waste when the flow management is applied from the smallest element which is domestic waste. This design is also related to some important aspects such as environment, social, and economic by the way people sorting out the waste at the domestic level so that the organic waste can be used as fertilizer, and nonorganic waste can be collected and sold to the collector in which the income can be used by the community around the street (Fahruddin et al, 2014).

Beside community team work, the presence of government is really needed to help implementing the design of garbage flow management. As stated in UU No. 18 Year 2008 about Waste Management, in waste management, legal certainty, clarity of responsibilities and authorities of the Government, regional government, as well as the role of the community and the business world are required so that waste management can run proportionally, effectively, and efficiently.

This design can be implemented with planning and budgeting, and also socialization to the

people. Further research can be conducted to implement the design and involve the government. The evaluation can be performed after the implementation of the design of garbage flow.

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