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PROCESSING OF ORGANIC AND INORGANIC WASTE CAN INCREASE INCOME DURING THE COVID-19 PANDEMIC

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Abstract

The study aims to find out how far the waste management process in University of Muhammadiyah Mataram. The waste in University of Muhammadiyah Mataram has not been handled as well as possible. It can be seen that there are still many landfills that are not handled properly and waste is simply dumped beside the river which is next to University of Muhammadiyah Mataram. The research used a quantitative approach and observations were made from January 2021 to March 2021. The results of the researcher' observations found that all types of waste were simply thrown away. After the researcher conducted socialization and training for all janitors at the University of Muhammadiyah Mataram, plastic wastes such as plastic bottles from beverage packaging and others have been collected and then the Bintang Sejahtera waste bank came to buy the inorganic waste, while organic waste from food scraps, especially the largest organic waste contributor came from canteen of University of Muhammadiyah Mataram, and the organic waste is used for maggot caterpillars or maggots.

Keywords: Organic Waste, Inorganic Waste, Management, Income

INTRODUCTION

Waste is an important problem that has not been resolved in Indonesia until now. The number of additional wastes is increasing as the human population increases. According to the Central Statistics Agency (BPS), plastic waste in Indonesia reaches 72 million tons/year (Febriadi, 2019). The number of the population continues to increase day by day, including the number of the population in Indonesia. Based on data from Worldometer, the population growth rate in Indonesia reaches 1.07%, which is considered high. The rapid population growth resulted in increasing economic, sociocultural, and industrial growth. This can also result in a shift in the quality and function of the environment that is not in accordance with its designation (Kusumaningrum 2020.)

The waste has always been a problem until now. Currently, it is only collected for disposal in Final Disposal Sites (FDS), then piled up or simply burned. Seeing the various problems regarding waste, it is very necessary for us to process and utilize waste to make waste more useful. One of them is the potential for waste to be used as a basic material for making cement, bricks, maggot caterpillar cultivation, and other goods of high economic value.

However, this time researcher will conduct research on organic waste transformed into maggot caterpillars. The maggot caterpillar or immature fly is the larva of a butterfly. Maggots are larvae derived from Black Soldier Fly (Hermatia Illucens, Stratimydae, Diptera) or BSF larvae (Putra & Ariesmayana, 2020).

The partners in this research are the Equipment and Household Section at the Bureau of General Administration and Finance. In the Equipment and Household Section, there are 25 cleaning staff scattered at the University level and divided into each Faculty, with the following details: There are 6 cleaning staff at the University, 3 at the Faculty of Engineering and the Faculty of Agriculture, 5 at the Health Faculty, in the Faculty of Social Sciences 3 people, in Faculty of Teacher Training and Education (FKIP) 3 people and in the New Library Building there are 2 people.

The Equipment and Household Section at the Bureau of General Administration and Finance of the University of Muhammadiyah Mataram has not yet processed waste. After the waste accumulates, the combustion process is carried out. Thus, there is no waste treatment.

Based on the problems above, the researcher and partners agreed to plan several activities, including: 1) Conduct socialization and training on waste sorting and processing of organic and inorganic waste so that it can become material of economic value; 2) Conducting a massive campaign on "waste is rupiah" within University of Muhammadiyah Mataram.

REVIEW OF LITERATURE

Waste

According to the definition of the World Health Organization (WHO) "waste is something that is not used, not used, not liked, or something that is thrown away that comes from human activities and does not happen by itself (Handayani, 2019).

In Law No. 18 of 2008 concerning waste management, it is stated that the definition of waste is the remainder of human daily activities and/or from natural processes in the form of solid or liquid (Waluyo et al., 2019).

Based on this description, waste has clear boundaries as something that is unwanted and comes from human activities and does not occur by itself (Rosmala et al., 2020). Therefore, the waste contains the following principles: a) The presence of an object or solid material; b) There is a direct relationship with human activities; c) The object or material is no longer used.

Organic and Inorganic Waste

Organic waste is waste that can decompose or can be decomposed again with the help of other bacteria. However, untreated organic waste can also cause environmental disturbances in the form of unpleasant odors that interfere with comfort and cause the environment to look shabby. Therefore, although it can be decomposed easily, organic waste also needs to be considered carefully. Inorganic waste is waste that comes from the rest of human activities that are difficult to decompose by bacteria, so it takes a long time to be decomposed. The nature of inorganic waste that is difficult to decompose causes various problems because some waste will decompose in a period of hundreds of years while the amount of waste is increasing every day (Yogiesti et al., 2010).

The concept of this waste bank is not much different from the concept of 3R (Reduce, Reuse, Recycle). If in the 3R concept it is emphasized how to reduce the amount

of waste generated by using or recycling it, in this waste bank concept, the most emphasis is how to make waste that is considered useless and has no benefits can provide its own benefits in the form of money, so that people are motivated to sort the waste they produce (Samudi et al., 2018).

Waste management according to Law No. 18 of 2008 is a systematic, comprehensive, and sustainable activity that includes waste reduction and handling (Sekarsari et al., 2020). Waste reduction includes activities: a) Restriction of landfill; b) Recycle trash; c) Waste utilization. Meanwhile, waste management includes the following activities: a) Sorting in the form of grouping and separating waste according to the type, amount and or nature; b) Collecting in the form of collection and transfer of waste to temporary shelters or appropriate integrated waste management; c) Transporting in the form of carrying waste from the source and or from temporary shelters or from integrated waste collection sites to the final processing site (Samudi et al., 2018).

The impact of waste on the environment is that the liquid seepage of waste that enters the drainage or river will pollute the water. Various organisms including fish can die so that some species will disappear this causes changes in biological aquatic ecosystems. Then in social and economic conditions, it will form an unpleasant environment for the community, for example: bad smells and bad views because waste is scattered everywhere.

Factors Affecting Waste Management

The current reality is that waste becomes difficult to manage due to various reasons: a) The rapid development of technology; b) Increasing the standard of living of the community which is not accompanied by a harmony of knowledge about solid waste; c) Increased operating; d) Inefficient and incorrect waste management habits cause water, air and soil pollution, thereby increasing the population of disease-carrying vectors such as flies and rats; e) Failure to recycle and reuse used; f) It is increasingly difficult to obtain land as a landfill for waste (Purwaningrum, 2016). The waste management in the past and present does not pay attention to non-technical factors such as community participation and counseling about healthy and clean living.

Barriers to Waste Management

The problem of waste management in Indonesia is a complicated problem because (Handayani, 2019): a) More and more people object that their area is used as a waste dump;

b) Lack of supervision and implementation of regulations; c) It is difficult to store temporary waste that quickly rots, because of the hot weather; d) It is difficult to find community participation in disposing of waste in its place and maintaining cleanliness; e) Inadequate financing.

Maggot caterpillar

If you hear the word caterpillar or maggot, many will feel disgusted because these animals are considered pests and carry diseases. However, this one caterpillar, turned out to be a unique and useful caterpillar, different from caterpillars or maggots in general. These maggots are not ordinary maggots, but the larvae of the Black Soldier Fly (BSF). In the body, BSF contains natural antibiotic substances so that it does not carry disease agents (Putra & Ariesmayana, 2020).

Although classified as flies, BSF does not land in the waste and does not carry disease. Maggot BSF is an exciting and profitable innovation for breeders, farmers, and the wider community. BSF maggot can be used as fish and poultry feed and so forth. The use of maggot as fish feed can further excite consumption fish cultivation because the price is relatively cheap. For animal feed, maggot can accelerate the increase in livestock weight.

RESEARCH METHOD

The research approach uses qualitative method. The main tool is human, meaning that it involves the researcher himself as an instrument by paying attention to the researcher's ability in terms of asking, tracking, observing, understanding, and abstracting as an important tool that cannot be replaced by other means.

The researcher wants to describe in order to understand the phenomena experienced by research subjects about How Organic and Inorganic Waste Produced by the University of Muhammadiyah Mataram is able to increase the income of cleaning workers during the COVID-19 pandemic. The activity was conducted at the University of Muhammadiyah Mataram Jalan K.H. Ahmad Dahlan, No. 1, Pagesangan-Mataram City, West Nusa Tenggara. 83115. The choice of this location was based on the decision of the researcher.

The research instrument is the researcher himself. The researcher is the key instrument conducting own observations or unstructured interviews and the results of the interviews. The primary data is obtained directly from the source, informants who are

directly related to the research focus, which can be in the form of the words and actions of the informants who are observed and interviewed. In this study, primary data collection was carried out in natural conditions (natural setting).

Data collection techniques were carried out by means of participatory observation and in-depth interviews and documentation techniques in the form of sound recordings and photographs (Satori & Komariah, 2009). Informants were selected and assigned while in the field, using the "snowball sampling" technique. At last, the qualitative analysis techniques used data reduction, data display and draw conclusions.

RESULTS AND DISCUSSION

The existing waste must be managed in such a way so as not to cause unfavorable impacts or problems for campus life in general, especially in terms of environmental health of the surrounding community. In general, the types of waste generated by work units within University of Muhammadiyah Mataram consist of paper, cardboard, plastic, wood, dry and wet litter, food waste in packaging and stereo foam boxes, glass, metal, electronic equipment and office stationery, leaves and twigs of trees as well as grass swipes. Up to now, the Equipment and Household Division of University of Muhammadiyah Mataram has not handled the problem optimally. The waste is collected in 2 TPS 2 units of Waste Disposal Sites (TPS) as many as 2 TPS scattered throughout the campus area. And then after piling up burning, there are 25 implementing officers who carry waste regularly in each faculty. The results of this activity are expected to be a recommendation for students at the University of Muhammadiyah Mataram in taking policies related to solid waste in University of Muhammadiyah Mataram.

Seeing the phenomenon, the researcher took the initiative to conduct socialization and training to students and cleaners regarding the management of organic and inorganic waste produced by the University of Muhammadiyah Mataram. The following are the results of the socialization and training carried out by researcher for students and cleaners in University of Muhammadiyah Mataram:

Inorganic Waste

For inorganic waste, mineral water packaging is dominant, such as bottled and glass packaging. Since the socialization was carried out by researcher to students and janitors, the

awareness of students to dispose of waste in trash cans according to the type of waste disposed has begun to form, so that organic and inorganic waste has been grouped according to the researcher' expectations. And it is a great opportunity for janitors to collect inorganic waste into large sacks so that it can be sold to the Bintang Sejahtera Waste Bank and produce rupiahs where the plastic waste is sold at a price of 1,500 per kg. the inorganic waste produced by University of Muhammadiyah Mataram can afford it as supplement of the income of cleaning staff during the covid 19 pandemic.

Organic Waste

For organic waste, researcher conducted training for janitors to use organic waste to become maggot caterpillars or maggots that come from food scraps where the biggest contributors to waste are canteens of University of Muhammadiyah Mataram where the research was assisted by several students from the Faculty of Agriculture, Food Science and Technology.

The main tools used in this program are plastic buckets, machetes, sacks, stirrer, wood, plywood, nails, wire, hammer, saw, tape measure, bottles, and duct tape. While the materials used are water, bran, rotten fruit, rotten vegetables, food scraps and BSF fly maggot seeds.

The overall form of this activity as follow: a) Program preparation; b) Preparation of BSF fly cage and maggot container; c) Socialization about BSF waste and flies; d) Training on making BSF fly cages, maggot containers and waste processing; e) Monitoring and evaluation.

The working procedures for BSF fly cultivation include: a) Prepare tools and materials; b) Making fly cages and maggot containers; c) Chopping organic waste; d) Put the chopped waste into the maggot container; e) Cover the maggot container with a cloth and put it in a damp place; f) Monitoring every day to ensure the amount of waste is reduced; g) Sorting the remaining waste with the existing maggot; h) Large maggots are separated and placed in a bucket filled with bran for animal feed.

After the construction of the cages and containers was completed, the pupae from BSF flies were transferred into the cages and the maggots and organic waste into the containers. After being transferred, the pupae of BSF flies that were already in the cage were given water regularly and fruit or orange peels to get water nutrition. After one week,

the pupae of BSF flies will hatch into BSF flies, where the citrus scent will stimulate BSF flies to mate. After making the cage and seeing the development of the finished BSF maggot and flies, then further socialization was carried out regarding the introduction and explanation of BSF flies and their benefits.

The training was carried out at the same time as the practice of maggot caterpillar cultivation, where equipment and equipment for maggot caterpillar cultivation had been provided by the researcher. Alhamdulillah, the trial of the maggot caterpillar was successful, although the cocoons produced were not too much, only 2 kg, the cocoons were marketed at the bird market, there are those on Jalan Gelantik Cakranegara, Mataram City, West Nusa Tenggara. 83239 and sold for IDR 25,000 per kg.

Data analysis in this study begins with: Firstly, data reduction. Miles and Huberman explain that data reduction is a process of selecting, deciding, paying attention to simplification, abstraction, and transformation of raw data that emerges from written notes in the field. Secondly, the presentation of data (display) by Ardhana in Lexy J. Meleong. Namely the process of organizing data, organizing it into a pattern, category, and a basic description. Thirdly, the researcher conducted further analysis of data reduction and data display to draw a conclusion.(Diah, Muawanah 2018)

CONCLUSION

Never underestimate waste because waste can connect other people's lives when it is difficult. Inorganic waste can be sold directly to junk collectors. It can have a higher selling value, so we need to polish it a bit as handicrafts so that it will have a good selling value. Likewise, inorganic waste, the smell is very strong from leftover food waste, but the waste can be used as maggot caterpillar cultivation which is very useful for farmers as a food mixture and can be given to poultry because it has excellent nutrition

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