



Assisting Papringan Village Community in Building (Develop) a Clean Environment through Waste Management

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Abstract: Papringan Village is one of the villages in Kaliwungu Kudus Sub-district that has waste problems. A lot of waste is generated from various community activities, but there is no proper management. Based on observations made by the KKN team, the KKN team took steps to socialize and assist in waste management in Papringan village. This aims to increase community awareness and knowledge in waste management. Through the service strategy, namely preparation, planning, and implementation, the results showed that the local community became more aware of the waste problem, which was shown by the enthusiasm of the community in participating in the mentoring activities. Mentoring activities in making ecobricks, MOL, bokashi, and biopores can help problems in waste management in the community. The community became more skilled and creative in managing organic and inorganic waste.

Keywords: Mentoring, Management, Waste, Socialization

1. Introduction

Waste is organic or inorganic material or substance produced by every human activity (Samadikun, 2018). According to Law No. 18/2008 on Waste Management, waste is the residue of daily human activities or natural processes in solid form. The problem of waste is serious and the amount continues to increase along with the increasing population (Prima, G, 2018). Deviant behavior in disposing and managing waste is a major factor in the increasing amount of waste in the community. Moreover, waste management facilities are still minimal in the community, making waste problems even more complex.

According to Samadikun (2018), community participation is one of the important factors in solving waste problems. This is because the success in waste management can be seen from how much the level of participation and contribution of the community. This low participation can be seen from the results of research by Febrianti et al., (2022), which shows that there are still many people in the Tuah Madani District of Pekanbaru City who behave badly in waste management by burning it themselves. Whereas burning waste causes GHG (Greenhouse Gas) emissions and air pollution which results in negative impacts on the environment and health (Wahyudi, 2019). Hazardous compounds produced from burning include CO, CO₂, CH₄, NO_x, SO₂, Volatile Organic Compound (VOC) compounds, Particulate Matter_{2.5} (PM_{2.5}), PM₁₀ (Das et al., 2018). These compounds have adverse effects on health in the short and long term.

Similar problems were encountered by the Muria Kudus University KKN team in Papringan Village, Kaliwungu District, Kudus Regency. Based on observations made by the team, various types of waste, both organic and inorganic, were found around the community. The community does not manage waste properly. They only throw the waste into the village waste disposal site (TPS) and burn it openly. In addition, in each house there is also no separation of organic and inorganic waste bins but mixes the two types of waste in one place. Thus, it can be concluded that community awareness in waste management is still lacking.

Seeing the phenomenon that occurred in Papringan Village, it is necessary to assist the community in managing waste into more useful items. The items in question are ecobricks, MOL, bokashi, and biopores. These items are made from various types of organic and inorganic waste that can be utilized in making chairs, tables, and so on (for ecobricks),

as well as in agriculture (MOL and bokashi), and the environment (biopores). Therefore, the author formulates the purpose of writing this article as assisting the Papringan Village community in building a clean environment through waste management.

2. Method

The process of community assistance in Papringan Village, Kaliwungu Sub-district, Kudus Regency consists of three stages, namely the preparation stage, the planning stage, and the implementation stage. In the preparation stage, a preliminary survey was conducted in the form of collecting information about environmental problems in the village and analyzing which groups of community actors lacked knowledge in waste management. In the planning stage, the mentoring topic and the mentoring subject were determined. The topic of mentoring is designed starting from the socialization process regarding the types of waste to the right way of management with the subject of mentoring is the youth group. Furthermore, in the implementation stage, two types of actions were carried out, namely (1) socialization about the types of waste and its management, and (2) practice of making ecobricks, MOL, bokashi, and biopores.

3. Results

The community mentoring activities began with coordination between the Papringan village apparatus and the local community. Papringan village officials and the local community, an agreement was reached that the activities of the Youth Posyandu RT 06 RW 04 would be the subject of socializing waste management. In addition, the KKN team also conducted environmental observations in the local community. The results of these observations showed that there was no proper handling of the waste problem as presented in Fig. 1. Waste has not been properly segregated between organic and inorganic types. The habit of burning waste is also often practiced by the local community, both in the home environment and at the TPS (Temporary Disposal Site) at the end of the village. Teenagers are the main target in this mentoring activity because they are expected to become an environmentally conscious generation by utilizing waste into more useful items.



Fig. 1. Papringan Village Waste Disposal Site

Based on the results of these observations, the KKN team planned a mentoring program that was divided into two stages, namely socialization about proper waste management and the practice of making ecobricks, MOL, bokashi, and biopores. The socialization material was prepared using Canva media in the form of presentation slides, while the tools and materials prepared in making ecobricks, MOL, bokashi, and biopores were aqua bottles, plastic waste, EM4, 2 liters of rice washing water, 1 liter of coconut water, molasses, 1 sack of husk charcoal, 3 kg of bran, and 500 grams of vegetable and fruit waste each as shown in Fig. 2-4. These materials were then tested by the KKN team to make ecobricks, MOL, and bokashi before being practiced as mentoring to the local community.



Fig. 2. Ecobrick making by the KKN team



Fig. 3. Making MOL by the KKN Team



Fig. 4. Making Bokashi by the KKN Team

Furthermore, at the implementation stage, the KKN team divided the implementation of mentoring into two stages, namely

1. Socialization of “Papringan Village Community Assistance in Building a Clean Environment through Waste Management”.
2. Assistance in making ecobricks, MOL, bokashi, and biopores.
3. Socialization activities were carried out on Thursday, August 31, 2023 at 19.30 WIB. The activity was attended by 15 teenagers consisting of boys and girls, as well as several villagers totaling around 10 people as illustrated in Figure 5. The topics discussed in this socialization activity are as follows.
4. The difference between organic waste and inorganic waste
5. The impact of waste disposal on the environment
6. Examples of proper waste management
7. Ecobrik and how it is made, along with examples of products that can be produced
8. Making MOL and bokashi
9. Making bio pores and its role for the environment



Fig. 5. Waste Management Socialization Activity

A question-and-answer session was opened to provide an opportunity for the community to express the problems they have faced so far. Some of them admitted that they did not really understand proper waste management. The local community was very enthusiastic in listening and providing feedback when the KKN team presented the material. This

activity is expected to trigger awareness, especially teenagers as the next generation, of the importance of proper waste management in order to create a clean environment and utilize waste into more useful items.

Furthermore, mentoring activities for making ecobricks, MOL, bokashi, and biopores were carried out on Saturday, September 9, 2023. The activity was attended by several youths or teenagers of Papringan village. The activity began with making biopores in the ground. Participants were asked to assist the KKN team in making holes that would be entered by organic waste as biopores. The organic waste used is some vegetable and fruit waste.

After making biopores, the participants continued to make bokashi fertilizer. This fertilizer is made by making dough from organic waste cut into small pieces and bran watered with EM4 solution and sugar water. The finished dough is placed in a sack that is closed tightly and allowed to stand for 5-7 days. Bokashi fertilizer is ready to be used on plants when the texture and color of the material is like soil.

The activity continued with the making of MOL (Micro Local Organisms), which is a liquid organic fertilizer to repel plant pests. Making MOL is done by mixing rice washing water and coconut water in a bucket container. Next, 100 ml of young coconut water and two caps of EM4 were added. The mixture is then stirred until evenly distributed and put into a tightly closed jerry can. This MOL is ready to use after standing for approximately 14 days.

The last activity is ecobricking. This ecobrick making requires several mineral water bottles as the main media filled with pieces of plastic waste. The plastic pieces inserted into the bottle are pressed until they are solid filling the entire cavity in the bottle. The bottles that have been filled with plastic waste can be collected to form more useful items, such as tables, plants, or others as presented in Fig. 6.



Fig. 6. Mentoring Activities with Papringan Village Teenagers

The KKN team actively involved village youth to help with the process of making biopores, bokashi, MOL, and ecobricks. This is so that mentoring participants can directly understand the manufacturing process. The teenagers were also enthusiastic in the mentoring activities. This activity is expected to raise the local community's awareness of the importance of proper waste management by generating creativity in making a more useful work in the future.

4. Discussion

The socialization activity with the theme of the importance of waste management followed by the Papringan village youth community aims to increase public awareness in waste management through the development of waste management knowledge. According to Lawrence Green's theory (Aulia et al. 2021) states that public awareness in waste problems is influenced by driving factors. This factor comes from within the individual who provides the reason or motivation to perform each behavior. These driving factors can include individual or community knowledge of waste problems. Through socialization activities carried out by the KKN team, it is hoped that it will form deeper knowledge to Papringan village youth about waste problems and their management. In line with Asteria & Heruman (Svari & Sutarna, 2022), education or socialization to the community needs to be done to increase awareness and skills in managing waste.

In order for the community or Papringan village youth to know the importance of waste management, the KKN team provides assistance in waste management. According to (Svari & Sutarna, 2022), socialization and mentoring activities can increase community knowledge and awareness of the importance of waste management. Moreover, deep ignorance related to waste management is an important factor causing low community participation in waste management (Istiningsih et al. 2024). Thus, the mentoring activities are expected to sensitize the community in waste management.

The KKN team's mentoring activities are carried out by making various waste management, such as ecobricks, MOL, bokashi, and biopores. According to Widiyarsari et al.,(2021), ecobricks are one of the creative plastic waste management efforts to become useful items and reduce pollution caused by plastic waste. The function of ecobricking is not to destroy plastic waste, but to extend the life of these plastics and process them into something useful that can be

utilized for the benefit of humans in general. In addition, according to Istirokhatun & Nugraha (2019), the purpose of ecobricking is to reduce plastic waste through the recycling process with plastic bottle media to be used as something useful. The existence of education through this mentoring activity is expected to be able to foster an anti-plastic culture and the community, especially teenagers, can better protect the environment in order to create a clean and healthy environment.

MOL making was also carried out in the mentoring activity. According to Fitriatin, Sofyan, & Yuniarti (2021), local microorganisms (MOL) are fermented solutions from organic materials or household waste. The result of this fermentation produces an MOL solution that contains macro and micro nutrients and several microorganisms that can increase plant growth. MOL is usually used as a starter in making solid organic fertilizers and liquid fertilizers (Amir et al., 2021).

The main ingredients used in making local microorganisms are carbohydrates, glucose, and microorganism sources (Wardani et al., 2021). Materials that are a source of carbohydrates are useful as a source of microbial energy or living media for microorganisms such as tap water, rotten cassava, rotten potatoes, banana peels, banana stumps, and fruit peels. Glucose is useful as a source of energy that is easily digested for breeding, for example, java sugar solution, molasses, coconut water, sugar cane water, expired honey, granulated sugar, sap water. The source of microorganisms can be vegetable (cow urine, rabbit urine, fish) and animal (conch, shrimp paste, stale rice, cassava tape, stale yakult, stale yogurt, moldy bamboo leaves, rotten vegetables) or EM4 (Handayani et al., 2015). Meanwhile, in the MOL making assistance activities carried out by the KKN team, the carbohydrate source is tajin water, the glucose source uses coconut water, and the microorganism source uses EM4.

The next activity is assistance in making bokashi. According to Kastalani et al., (2017), bokashi is compost produced through fermentation by giving Effektive Mikroorganisme-4 (EM4) which is one of the activators to accelerate the composting process. During the process of making bokashi, a composting event occurs which is a process of breaking down organic matter involving microorganisms in a controlled state. The process of breaking down or decomposition of organic matter into organic substances in the form of ions available to plants supports the availability of nutrients, both macro and micro.

Making bokashi in this mentoring activity uses a mixture of organic materials such as husks, bran, and some rotten fruit and vegetable peels which are fermented using EM4. According to Tabun et al., (2017), bran is the best material for making bokashi because it contains organic matter.

Making the best bokashi because it contains nutrients that are very good for microorganisms. The advantage of using EM4 technology is that organic fertilizer (compost) can be produced in a relatively short time compared to conventional methods because it contains *Azotobacter* sp., *Lactobacillus* sp., yeast, photosynthetic bacteria and cellulose-degrading fungi.

According to Andriani et al., (2021), bokashi is an organic fertilizer whose use does not damage soil fertility because it is environmentally friendly, besides the price is affordable and can be made by farmers themselves. In addition, bokashi can also increase the availability of N, P, and K nutrients for plant growth. Thus, the KKN team's assistance activities are expected to increase the knowledge and skills of the Papringan village community, especially farmer groups who can utilize bokashi fertilizer on their plants.

Utilization of organic waste can also be used in making biopore infiltration holes (LRB). According to the Minister of Environment Regulation Number 12 of 2009 (Elsie et al., 2017) concerning Rainwater Utilization, LRB is a hole made perpendicular to the ground, with a diameter of 10-25 cm and a depth of about 100 cm or not exceeding the depth of the groundwater table. LRBs are small holes in the soil that are formed due to the activity of soil organisms such as worms, movement of roots in the soil, termites and other animals. The hole is filled with air until it enters the water stream. Rainwater does not directly enter the gutter but seeps into the soil through the hole.

According to Arifin et al., (2020), organic waste that can be used in making biopore infiltration holes includes leaves, kitchen waste, tree branches, non-chemical kitchen food waste, and so on. The organic waste used in this mentoring activity is kitchen waste and unused vegetables. This organic waste plays a role in providing food for worms so that the worms can make small holes in the soil that will be filled with air until water enters. In simple terms, the working principle of biopore infiltration holes is to store and absorb rainwater into the hole and seep into the soil as infiltration water (Hidayat et al., 2021). This biopore infiltration pit has several benefits, including flood control, protecting and improving groundwater quality, suppressing erosion rates and in the long term can provide sufficient groundwater reserves, and can also increase soil fertility.

5. Conclusion

Waste management socialization and mentoring activities have been attended by Papringan village youth. The socialization delivered by the KKN team contained an explanation of organic and inorganic waste, the impact of waste, and how to process waste. The socialization activity is expected to increase the knowledge and creativity of village youth in proper waste management. In addition, the socialization is also expected to increase public awareness of the impact of waste and the need for proper management.

Through the mentoring activities of making ecobricks, MOL, bokashi, and biopores, Papringan village youth can be skilled in managing waste appropriately. The results of this waste management are very beneficial for the lives around them. Ecobricking can reduce the amount of plastic waste into something more useful. Making MOL and bokashi using organic waste can produce organic fertilizer, both liquid and solid, which can fertilize plants. Making biopores can increase the water catchment area considering that the Papringan village environment is quite barren and hot.

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