

Educating in Utilization of Household Waste into Eco-enzymes and Eco-bricks at Densely Populated Community in Bandung Regency

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ABSTRACT

. Eco-enzymes are a natural alternative to harmful synthetic chemicals in the home. Changing organic kitchen waste from vegetable and fruit waste into household and environmental recycling materials can help solve the waste problem. Eco-enzyme liquid has many uses, such as washing dishes, clothes, floors, hair, body wash, hand sanitizer, body detox, air freshener, radiation blocker, pool cleaner, pet and organic fertilizers and pesticides that can be made from organic waste. This community service program aimed to increase public awareness and sensitivity to the problems that were found in the environment, provide ideas for entrepreneurship such as the utilization of waste in the form of eco enzymes, and eco brick. The socialization activities were carried out through presentations, discussions, and demonstrations of making eco enzymes, as well as distributing questionnaires to find out the increase in the level of public understanding before and after the activity was carried out. The questionnaire results showed that people's knowledge about the use of organic waste to make eco enzymes increased after participating in extension activities, as well as the community's interest in processing organic waste into eco enzymes and using them in daily life

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INTRODUCTION

Waste is anything produced by human or animal activities in solid, slurry, liquid, or gas that is discarded because it is no longer required or desired. Waste is classified into two types: organic waste and non-organic waste. Households, offices, schools, markets, and tourist sites are all potential sources of waste (Mahyudin, 2014). The volume of garbage will progressively increase over time. One of the issues that must be addressed promptly is the handling and processing of waste from source to landfill. We hope that environmental contamination from garbage can be reduced (Damanhuri & Padmi, 2012; Jelita, 2022). The rise of the population in Mekarrahayu village, Bandung Regency, has resulted in most of the village area being used as residential land, resulting in new issues, specifically concerning waste (Mahyudin, 2014). There are still many people who are unaware of the value of proper garbage management. Therefore, it is not unexpected that there is still much waste stacking up on the riverbanks or straight in the river, which is an issue that is difficult to handle without community collaboration. As a result, socialization activities were held in Mekarrahayu village, Margaasih District, Bandung Regency, with the topic of Utilizing Organic Waste to Make Eco-Enzyme and Inorganic Waste to Make Eco-bricks. Managing waste into eco-enzymes and eco-brick is alternative waste management that involves direct community participation (Budiyanto et al., 2022; Hakim et al., 2022; Prasetyo et al., 2021).

This Community service program (CSP) aimed to 1. Applying the Tri Dharma ideals of Higher Education through community service through outreach activities. 2. Use academic skills to improve the CSP team's sense of responsibility, insight, attitudes, and social behavior. 3. Determine the current state of garbage in Mekarrahayu village. This CSP provides societal benefits in the following ways: a. Increase community knowledge and sensitivity in reacting to environmental problems in their area. b. Developing new concepts in entrepreneurship, such as the usage of trash in the form of eco enzymes. c. For the village government, this activity is useful as a consideration for applying CSP outcomes.

METHOD

Preparation Stage

This step marks the start of PPM implementation by completing a location assessment to assess the environmental and community circumstances in the location that will be used for PPM activities and identifying and determining PPM subjects. Problem identification and analysis are performed, followed by data processing and PPM activity planning. The socialization activity of converting organic waste into eco-enzymes was determined to be carried out among citizens association (RW) 28 Mekarrahayu village residents. The socialization of the use of inorganic waste into eco-bricks was chosen to be carried out for students in grades IV and V of elementary schools in Mekarrahayu village, namely SDN Rahayu 6 and SDIT Fitrah Insani.

Implementation Stage

The socialization of converting waste into eco-enzymes and eco-bricks was carried out through discussion, counseling forums, and demonstrations. The counseling approach used participatory methods. The counseling and training activities were directed to increase the knowledge of the community and elementary school students regarding waste management in the community so far. In this activity, participants were allowed to ask questions and express their views on household waste to increase their understanding of the socialization material provided.

The planning process and strategies used in this CSP can be seen in the following flow chart:

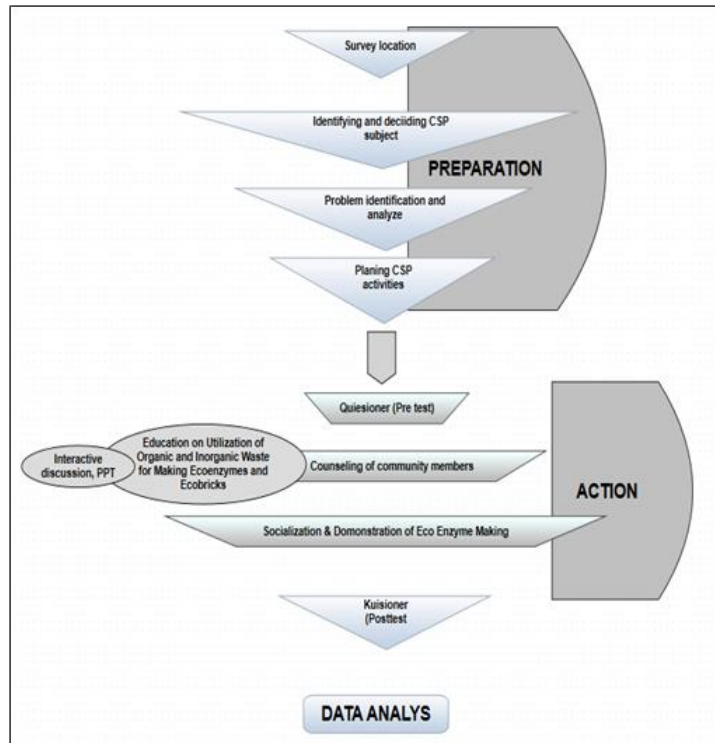


FIGURE 1. CSP activity for the education of using organic and inorganic waste for making eco-enzymes and eco-bricks.

The success of socialization activities, including the increasing knowledge and understanding of utilizing waste, was evaluated through questionnaires before and after the outreach activities (pre-test and post-test). The percentage value of increasing understanding of socialization participants was analyzed descriptively.



FIGURE 2. Supporting media for socialization activities on using organic and inorganic waste in Mekarrahayu village, Bandung Regency.

RESULTS AND DISCUSSION

Participants in socialization activities

The CSP activity for making eco enzymes was attended by 32 participants consisting of representatives of RW 28 residents (21 people), village officials (3 people), and youth organizations (4 people) of Mekarrahayu village, Margaasih District, Bandung Regency. The eco-brick-making activity was attended by class IV and V students of SDN Rahayu 6 (71 students) and SDIT Fitrah Insani (49 students).



FIGURE 3. Socialization activities of organic and inorganic waste utilization to make eco-enzymes and eco-bricks at Mekarrahayu village, Bandung Regency.



FIGURE 4. Socialization activities of inorganic waste utilization into eco-bricks at SDN Rahayu 6 and SDIT Fitrah Insani, Mekarrahayu village, Bandung Regency.

Citizens' perceptions about trash disposal

The counseling activity was the main socialization activity in this CSP, namely the management and utilization of organic and inorganic waste into eco-enzymes and eco-bricks for the community at Mekarrahayu village. Apart from demonstrating the making of eco enzymes and eco-bricks during the socialization, the product examples made by the Unpad CSP team and the students of SD Rahayu 6 and SDIT Fitrah Insani, such as composter barrel and eco-brick, were also presented. The composter barrel

was made of organic waste, especially food waste, to reduce environmental waste. The composter barrel can be used to make organic fertilizer for plants useful for the people of Mekarrahayu village, especially those whose livelihood or field is agriculture. The eco-brick in the form of a multi-purpose table was made of inorganic waste in the form of compacted plastic bottles.

The results of questionnaires for 152 respondents consisting of 32 representatives from citizens association (Rukun Warga/RW) 28 residents, youth groups, representation of Mekarrahayu village officials, and 120 pupils of SDN Rahayu 6 and SDIT Fitrah Insani showed a significant increase in the understanding of village residents and elementary school students regarding waste management and utilization before and after socialization. Respondents also stated that the series of socialization activities provided through counseling and supporting media in the form of banners, posters, and discussion forums were very useful for dealing with one of the environmental problems in Mekarrahayu village. The following pictures show a questionnaire's results regarding utilizing organic and inorganic waste into eco-enzymes and eco-bricks and making composter barrels in Mekarrahayu village, Margaasih, Bandung Regency.

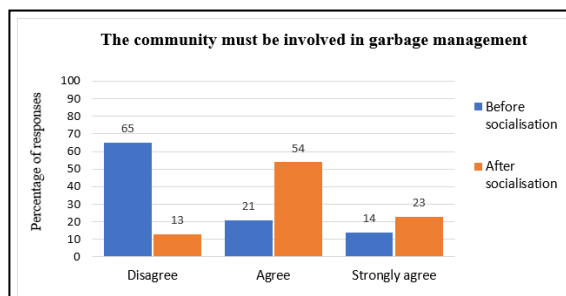


FIGURE 5. Perception of Mekarrahayu village residents managing household waste.

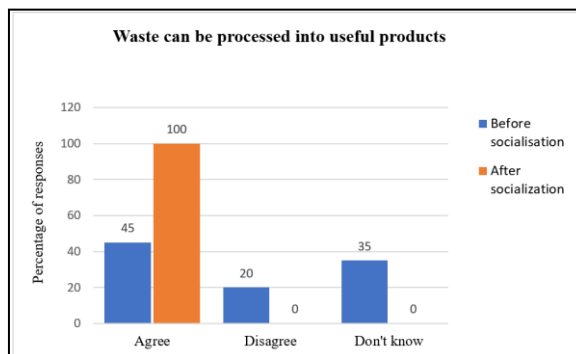


FIGURE 6. Knowledge of Mekarrahayu village residents regarding household waste management before and after socialization activities.

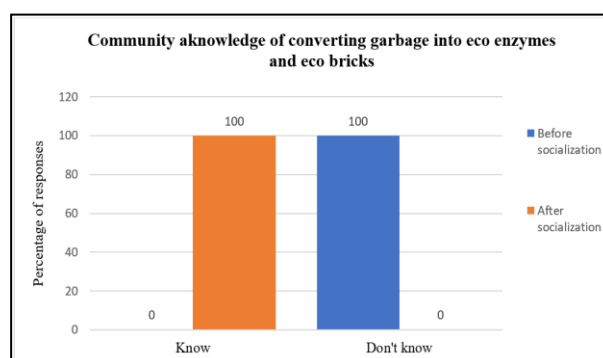


FIGURE 7. Knowledge of Mekarrahayu village residents regarding utilizing waste become eco-enzymes and eco-bricks before and after socialization activities.

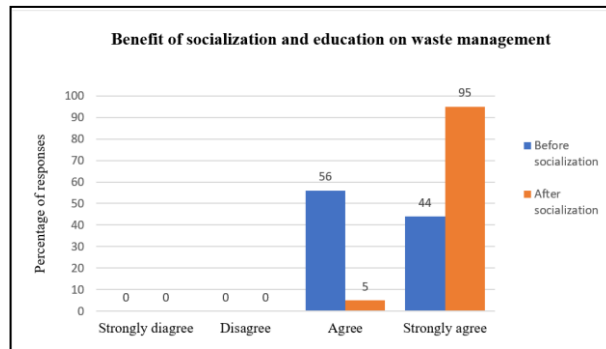


FIGURE 8. Responses of Mekarrahayu village residents regarding the benefits of socialization activities on household waste management before and after socialization activities.

Based on descriptive analysis of activity results, socialization activities have an impact on residents related to changes in their knowledge and understanding of the management and utilization of organic and inorganic waste. The Mekarrahayu village community understands how to utilize and manage organic and inorganic waste. The participants knew how to manage the environment well. The community viewed that the education about organic waste processing by the campus community service team really helps the community in managing waste in their environment because there is no independent program carried out by the village government (Khairul et al., 2022; Septiani et al., 2021).

The Mekarrahayu village community takes care regarding the environment by implementing methods for utilizing and managing organic and inorganic waste into eco enzymes and eco-bricks. The community was enthusiastic about utilizing organic waste to become eco-enzymes, mainly for household needs such as organic fertilizer and cleaning household appliances (Alkadri & Asmara, 2020; Budiyanto et al., 2022; Kusumaningsari, 2017; Septiani et al., 2021). The community strongly agreed on the benefit of CSP so that the results of this socialization can change the habits of the people of Mekarrahayu village to become more concerned about the environment and can utilize both organic and inorganic waste into useful products.

Based on the results of the questionnaire at the end of this community service activity, it was known that the community has gained valuable knowledge and experience regarding waste management, especially waste from household waste. Village administrators and the community responded positively to this service activity because education on the use of household waste cannot be fully carried out by the government alone. This is in line with Tabalessy et al. (2022) and Dayera et al. (2023) that the community is quite enthusiastic and plays an active role in waste management training activities because generally the community only understands the impacts caused by waste, but is not very aware of the need for waste management in the area to produce a clean and clean area. beautiful and free of rubbish. Therefore, socialization and training to develop a sense of concern for the environment in the community is very important to create a clean and healthy environment. It would be better if this activity is carried out periodically and continuously so that it can become a shared culture in the community in managing waste in the environment so that a clean environment can be created and can also become a part of income, especially for people who live in dense settlements with low incomes.

CONCLUSION AND RECOMMENDATION

The CSP activities increased the knowledge and awareness of the community regarding protecting the environment and processing waste into useful products. The questionnaire result showed an increase in participants' perception of utilizing organic waste from household waste into eco-enzymes that were useful as fertilizer for plants in their yards and household appliance cleaners. Community members were

also enthusiastic about utilizing organic waste to make a composter trash barrel, which was useful for producing organic fertilizer for plants. Inorganic waste can also be used to make eco-bricks.

The CSP resulted in the recommendation both for community and village authority. For the community: the community can play an active role in waste management, for example, by making eco-enzymes, eco-bricks, and composter trash barrels. All three have extraordinary benefits and could have a high selling value to improve the community's welfare if eco-enzyme products sell well. For the village government: the village government can make regulations regarding the prohibition of littering, such as issuing fines. The government can hold outreach events regarding the importance of insight regarding waste management and can facilitate the community and TPST (Integrated Waste Disposal Site) managers in Mekarrahayu to make Eco-enzyme products.

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