

Utilization of Organic Waste for Maggot Cultivation for Members of the Medana Village Women's Reading Club

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ABSTRACT

This community service activity was carried out in Medana Village, Tanjung District, North Lombok Regency, with target partners of the Women's Reading Club members. The urgency of this activity departs from the problem of household organic waste management which is still low. Garbage is generally burned or simply thrown away, causing environmental pollution. On the other hand, organic waste has great potential to be used as a product of economic value through maggot cultivation (Black Soldier Fly / BSF larvae). The purpose of this activity is to increase environmental awareness as well as practical skills of participants in processing household organic waste. The program is also aimed at opening up maggot-based business opportunities, thereby supporting the economic empowerment of village women.

INTRODUCTION

The waste problem is one of the most crucial environmental issues facing Indonesia in this modern era. Rapid population growth and changes in people's consumption patterns have led to a significant increase in the volume of national waste generation, which now reaches tens of millions of tons per year (Nugroho et al., 2024). Statistical data show that the household sector is the largest contributor to the total national waste generation, where the composition of organic waste dominates with percentages ranging from 50% to 70% (Widiani & Novitasari, 2023). The accumulation of organic waste that is not properly managed has a multidimensional negative impact. From an environmental perspective, the anaerobic decomposition process of organic waste in landfills results in methane gas emissions that contribute greatly to global warming and the damage to the ozone layer (Wahyono et al., 2024). In terms of public health, decomposing piles of organic waste become a means of breeding disease vectors such as flies and rats, which have the potential to trigger the spread of pathogens that cause diarrhea, cholera, and typhoid (Oktaviyanti et al., 2023).

In the midst of the environmental crisis, the waste management paradigm in Indonesia began to transform from a linear system of "collect-transport-dump" to a circular economy approach. The circular economy emphasizes the principle of resource recovery, where waste is no longer seen as useless residue, but as a potential resource that can be reprocessed into products of economic value (Nurindra et al., 2025). Waste management based on a circular economy requires active community empowerment so that waste management can be completed as early as possible at the source level (Nurhaliza, 2025). This empowerment is the key to environmental sustainability as well as an instrument to improve economic welfare for communities that are able to convert waste into productive assets (Kurniawan et al., 2025; Marodiyah et al., 2023).

This condition is in line with the challenges faced by Medana Village, Tanjung District, North Lombok Regency. As an area with fairly high agrarian potential, Medana Village produces a significant amount of household organic waste and agricultural activity residues. In the midst of village development, one of the main issues faced by the community is the problem of household organic waste management. Based on initial observations, most of the organic waste in the form of food waste, fruit peels, vegetable residues, and dry leaves has not been managed optimally. Some people choose to burn the waste, while others just throw it in the trash without a processing process. This practice causes various negative impacts, such as air pollution, the occurrence of unpleasant odors, and contributes to environmental pollution.

The partner of the activity is the Medana Village Women's Reading Club, a women's community consisting of housewives and young women. This club was initially formed as a forum for literacy and increasing interest in reading, but as it developed, it also functioned as a means of empowering women in various fields. Club members have great potential to act as agents of change, but still face limitations in terms of technical skills, especially when it comes to productive household waste management.

The results of the initial survey showed that club members were interested in learning simple technology in the treatment of organic waste. However, they need systematic practical assistance to be able to turn this potential into real skills. This situation makes the Women's Reading Club a relevant partner for community service activities, because it has a passion for learning, a strong community network, and a strategic role in the household and social environment. The main problems identified include lack of awareness of the importance of organic waste management and the adverse effects of incineratory or littering practices; limited technical skills in processing organic waste into products with useful value; lack of access to simple technology that can be applied at the household level; and there is no economic utilization of organic waste, even though this potential can support the improvement of family welfare.

Maggot cultivation is a relevant solution in this context. Maggots, or black fly larvae (Black Soldier Fly/BSF), can process organic waste quickly and efficiently and produce products of high economic value such as animal feed. Maggot are fly larvae or flower insects whose existence of flies has only been considered as a pest by most people. The BSF maggot has the Latin name *Hermetia illuciens* L, which belongs to the fly brother (Diptera family), its adult body resembles a bee, is black and has a length of 15-20 millimeters (Afkar et al., 2020). Previous studies have shown that waste management through maggot cultivation can reduce the volume of organic waste by up to 70% (Ussolikah, et al, 2023; Setiawan, and Wijayanti, 2023). The implementation of this technology not only helps overcome environmental problems, but also opens up new business opportunities that can support the economic empowerment of reading club members. In addition, the geographical conditions of Medana Village which are in the agricultural area support the implementation of maggot cultivation. Residual organic waste from households can be collected and used as the main raw material. Reading club members, with the right guidance, can be pioneers in innovative waste management at the community level. The application of this technology is also relevant to the principle of the circular economy, where waste is converted into useful products in a sustainable manner (Putri et., al 2023).

The focus of this activity is also in line with the community service agenda that was previously carried out, namely economic-based environmental management and the empowerment of women as key actors in change. The inclusion of women in every service activity because women have the potential to make changes for the better in the environment where they live.

IMPLEMENTATION AND METHODS

Community service activities in Medana Village are designed using a participatory approach, where the target partner, namely members of the Medana Village Women's Reading Club, is actively involved in every stage of the activity. This approach was chosen to encourage knowledge transfer, skill improvement, and community capacity building in a sustainable manner. The activity will be held in June 2025 involving 20 members of the Medana Village Women's Reading Club.

Figure 1 shows the flow of the program implementation stages consisting of socialization activities, training, technology application, mentoring and evaluation, evaluation of results, and program sustainability. Each stage is systematically designed to improve participants' knowledge and skills in managing organic waste through Black Soldier Fly (BSF) maggot cultivation.

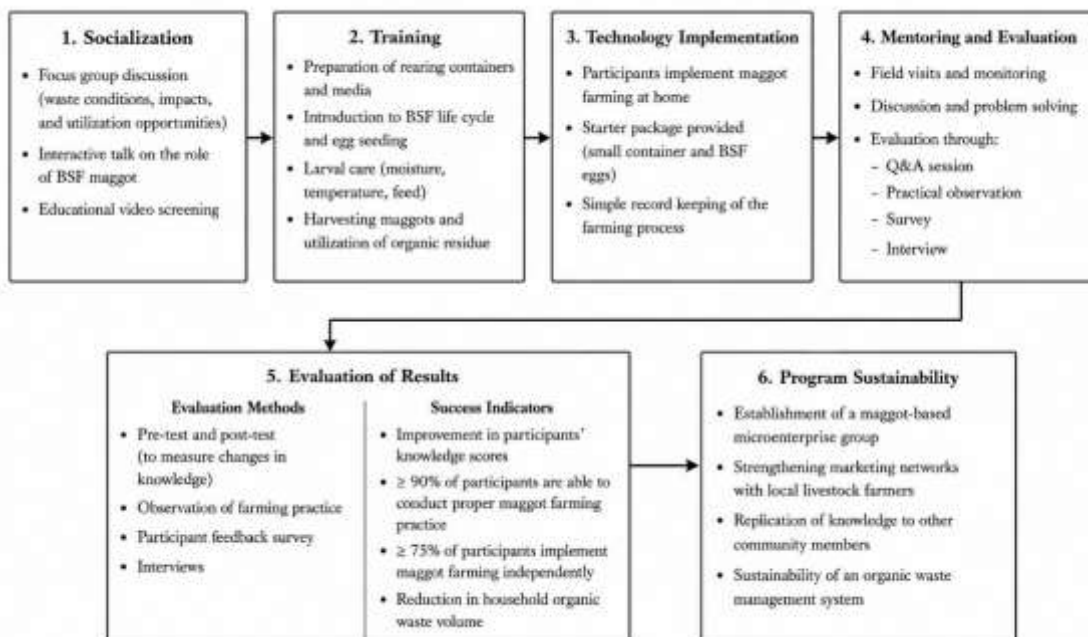


Figure 1. Flow of Community Service Program Implementation for Organic Waste Utilization through Maggot Farming in Medana Village

The first stage is socialization, which aims to increase participants' awareness of the importance of household organic waste management. This activity was carried out through a Focus Group Discussion (FGD) which discussed the condition of waste management in the community, its impact on health and the environment, as well as opportunities to use organic waste into products of economic value. In addition, participants obtained material through interactive lectures on the role of Black Soldier Fly (BSF) maggots in organic waste management supported by educational video screenings.

The second stage is maggot cultivation training, which is carried out using a *learning by doing approach*. At this stage, participants not only receive the material theoretically, but also practice it directly. The training materials include the preparation of containers and cultivation media, the introduction of the life cycle of Black Soldier Fly (BSF), egg dispersal techniques, larval rearing, humidity and temperature control, maggot harvesting techniques, and the use of organic residues as fertilizer.

The third stage is the application of technology, namely the implementation of maggot cultivation by participants in their respective homes. To support the process, participants were given a simple starter package in the form of cultivation containers, BSF maggot eggs, and cultivation technical guides. During the implementation process, participants also made simple records related to the amount of organic waste used, the harvest obtained, and the obstacles faced.

The fourth stage is mentoring and evaluation, which is carried out through field visits, group discussions, and periodic technical consultations. The mentoring aims to help participants overcome various obstacles that arise during the cultivation process. Program evaluation is carried out using quantitative and qualitative approaches. Quantitative evaluation was carried out through pre-test and post-test to measure changes in participants' knowledge levels regarding organic waste management and BSF maggot cultivation. Meanwhile, qualitative evaluation was carried out through observation of cultivation practices, participant feedback surveys, interviews, and question and answer sessions.

The fifth stage is the evaluation of the results, which is carried out to measure the success rate of the program based on the indicators that have been set. Success indicators include increasing participants' knowledge about organic waste management and maggot cultivation, participants' ability to practice cultivation techniques correctly, the level of adoption of maggot cultivation independently, and reducing the volume of household organic waste disposed of into the environment.

The last stage is the sustainability of the program, which is focused on the formation of maggot-based business groups, strengthening marketing networks with local farmers, and disseminating knowledge to other communities. Through this approach, the program is expected not only to improve the skills of participants, but also to create a sustainable organic waste management system and provide economic value for the people of Medana Village.

RESULTS AND DISCUSSION

The service activity was carried out by involving 20 members of the Medada Village Women's Reading Club. The activity began with a socialization stage that aimed to increase participants' awareness of the importance of household organic waste management. At this stage, participants were invited to discuss the condition of household waste, the impact of waste on health and the environment, and opportunities for its use into products of economic value. The activity continued with an interactive lecture on the role of *Black Soldier Fly* (BSF) maggots in organic waste management using educational media in the form of short videos to facilitate participants' understanding. To find out the level of understanding of the participants, an evaluation was carried out through

questions and answers about the environmental impact of organic waste and the benefits of BSF maggot cultivation. The results of the evaluation showed that before the socialization activities, most of the participants did not understand organic waste management and maggot cultivation. After socialization was carried out, participants showed an increase in understanding of the material provided. In addition, most of the participants expressed interest and readiness to implement maggot cultivation in their respective homes.

The results of the activity showed that the service program had a positive impact on increasing knowledge, skills, and adoption of maggot cultivation technology by participants. Of the 20 participants involved, most showed an increased understanding of the environmental impact of organic waste and the benefits of maggot cultivation after participating in socialization activities. These findings indicate that educational approaches through group discussions, interactive lectures, and audiovisual media are effective in improving community environmental literacy. These results are in line with research by Setiawan and Wijayanti (2023) which states that women's empowerment through environmental education can increase public awareness of waste management while strengthening women's role in sustainable development.



Figure 2. Maggot Larvae

Figure 2 shows BSF maggot larvae that are the main objects in training activities. Participants were given the opportunity to observe firsthand the characteristics of the larvae, their life cycle, and the process of their use as a decomposer of organic waste. This direct observation is important to increase participants' understanding of maggot cultivation technology that will be applied in their respective households



Figure 3. Training Atmosphere

Figure 3 shows that at the training stage, as many as 90% of participants were able to practice making cultivation containers and preparing maggot media independently. This percentage shows that the practice-based training method (*learning by doing*) provides good results in improving the technical skills of participants. These findings support the results of research by Ussolikhah et al. (2023) who reported that participatory methods are more effective than conventional counseling in improving the ability of communities to adopt maggot cultivation technology. The high success rate of participants in cultivation practices shows that the technology introduced is relatively easy to understand and in accordance with the conditions of the local community.

During the training, participants showed high enthusiasm which was shown through active involvement in discussions as well as many questions regarding cultivation techniques, larval rearing, and utilization of maggot cultivation products. The high participation of participants shows that the technology introduced is easy to understand and in accordance with the needs of the local community. The results of the evaluation showed that 90% of participants were able to practice making cultivation containers and preparing media independently after participating in the training. This achievement indicates that the practice-based training method (*learning by doing*) is effective in improving the technical skills of participants. These findings are in line with the research of Ussolikhah et al. (2023) which states that the direct involvement of participants in the maggot cultivation process is able to improve understanding and technical skills more effectively than the theoretical delivery of material.

After the training, participants were encouraged to implement maggot cultivation independently in their respective homes. The monitoring results showed that 75% of participants successfully adopted maggot cultivation technology and applied it in household organic waste management. The application of this technology contributes to a reduction in the volume of household organic waste by 50–60%. Although this achievement is still below the results of Khawarizmi et al.'s (2023) research which reported the ability of BSF larvae to reduce organic waste by up to 70%, the results of this activity show that maggot cultivation has had a real impact on the household scale. The difference in achievement may be influenced by variations in the number of larvae used, the type of organic waste managed, and the duration of maintenance carried out by each participant.

In addition to providing environmental benefits, maggot cultivation has also begun to provide economic benefits for participants. Some participants have used maggot crops as a source of additional income with selling prices ranging from Rp15,000-Rp20,000 per kilogram, while the residue from waste decomposition is used as organic fertilizer. These findings reinforce the results of research by Putri et al. (2022) who stated that the use of organic waste through maggot cultivation can support the implementation of a circular economy by producing products with economic value while reducing household waste.

Overall, the results of the activity show that the combination of socialization, participatory training, technology application, and mentoring is able to increase community capacity in organic waste management based on a circular economy. The success of the program is not only reflected in the increase in knowledge and skills of the participants, but also from the high level of adoption of maggot cultivation technology (75%), the practical ability of the participants (90%), the reduction of the volume of household organic waste by up to 60%, as well as the emergence of economic benefits from the cultivation results. Thus, maggot cultivation has the potential to be a sustainable solution that not only supports household waste management, but also strengthens women's economic empowerment in Medana Village.

CONCLUSIONS AND RECOMMENDATIONS

Community service activities in Medana Village have succeeded in increasing the knowledge and skills of members of the Women's Reading Club in managing organic waste through maggot cultivation. Maggot cultivation results can be used as animal feed and organic fertilizer. This program not only has an impact on environmental aspects, but also empowers village women as agents of change. Continuous assistance needs to be carried out to ensure the sustainability of maggot cultivation practices, including the control of technical obstacles that may arise. Replication of the program is recommended in other villages in North Lombok Regency by involving different community groups, such as youth organizations or farmer groups, so that the positive impact is more widespread. Support from the village government and the private sector is needed to encourage the formation of maggot-based joint business units so that the program is more directed at sustainable economic empowerment.

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