



Organic Waste Processing in Efforts to Reduce Waste Accumulation: Social and Economic Impacts

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ABSTRACT

Organic waste management at SMP Negeri 1 Glagah faces challenges due to sanitation issues, limited facilities, and low environmental awareness. Waste from school activities that has not been managed optimally has led to a significant accumulation of waste, causing environmental pollution. To address this, an organic waste management program was implemented with the involvement of students and teachers. The methods used include observation, interviews, socialization, sorting training, and composting. Waste is processed in used plastic containers, which also serve as containers for growing school medicinal plants (TOS). The results of the activities show an increase in students' environmental awareness, as well as the creation of a simple waste management system and opportunities for creative economic activities. This program also supports skill-based learning and the role of students as agents of change. Despite facility constraints, it has had a positive impact on the environment, society, and education, while consistently applying the 3R principles (Reduce, Reuse, Recycle).

Pengolahan sampah organik di SMP Negeri 1 Glagah mengalami kesulitan karena masalah sanitasi, keterbatasan fasilitas, dan rendahnya kesadaran lingkungan. Sampah dari aktivitas sekolah yang belum dikelola secara optimal telah menyebabkan banyaknya akumulasi limbah yang membuat lingkungan menjadi tercemar. Untuk mengatasinya, diadakan program pengelolaan sampah organik dengan keterlibatan siswa dan guru. Metode yang digunakan meliputi observasi, wawancara, sosialisasi, pelatihan pemilahan, dan pembuatan kompos. Sampah diolah dalam galon plastik bekas yang didalamnya juga tumbuh tanaman obat sekolah (TOS). Hasil kegiatan menunjukkan peningkatan kesadaran siswa tentang lingkungan, serta tercipta sistem pengolahan sampah sederhana dan peluang ekonomi kreatif. Program ini juga mendukung pembelajaran berbasis keterampilan dan peran siswa sebagai agen perubahan. Meskipun ada kendala fasilitas, namun telah memberikan dampak positif bagi lingkungan, sosial, dan pendidikan, serta menerapkan prinsip 3R (Reduce, Reuse, Recycle) secara berkelanjutan.

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A. INTRODUCTION

SMP Negeri 1 Glagah is a public junior high school located in the rural area of Glagah Subdistrict, Lamongan Regency, East Java, with a total of 78 students , comprising 47 boys and 31 girls. This situation requires the school to create a safe, clean, and healthy learning environment. However, limited infrastructure and resources are major obstacles, particularly in managing waste generated from daily activities, such as waste in classrooms and offices, as well as solid waste from the school kitchen. Furthermore, waste management at this school has not been carried out optimally whether in terms of sorting, processing, or recycling which has resulted in suboptimal sanitation in the school environment.

In accordance with Law No. 18 of 2008, waste is defined as the solid byproducts of daily human activities and/or natural processes. The issue of waste itself is a serious environmental problem widely faced by Indonesian society (Yuwana & Adlan, 2021). Although various studies have addressed waste management in educational settings, most still focus on urban contexts or schools with adequate facilities. Meanwhile, research and waste management programs specifically tailored to the conditions of rural schools with limited infrastructure and resources remain very scarce. Consequently, there is a gap in the development and implementation of simple, practical, and sustainable waste management models suitable for schools like SMP Negeri 1 Glagah. This situation is becoming increasingly critical given the high volume of waste in Indonesia, which reaches approximately 64 million tons of waste per year, with a still-low recycling rate, as well as about 3.2 million tons of plastic waste polluting the oceans and coastal ecosystems (Waste International, 2025)

Human-generated waste is divided into two categories: organic waste and inorganic waste. Organic waste comes from natural materials and can be easily decomposed by microorganisms. Meanwhile, inorganic waste is difficult to decompose naturally and usually consists of dry materials that are difficult to rot. The habit of littering is still common in everyday life, even though trash bins are often located nearby. This situation results in a significant amount of waste scattered along roadside areas, often exceeding the amount found in trash bins. This behavior not only reflects a lack of awareness among the public but also has serious negative consequences. In addition to damaging the beauty of the environment and causing unpleasant odors, improperly disposed waste can lead to flooding on various scales, spread diseases, and contaminate the surrounding environment (Wardah & Sihmawati, 2025).

The increase in waste volume requires measures to improve waste management. One strategy is the 4R principle: reduce, reuse, recycle, and replace single-use products. Classifying waste into three categories-organic, inorganic, and hazardous waste-is important for proper handling. Sustainable education in schools is needed so that students can understand waste separation and management. This approach encourages students to create clean and healthy schools and become agents of change at home and in the community. Environmental education builds awareness to protect nature and encourages social programs such as waste banks. Good habits from school age will have a positive impact in the future and shape critical thinking. Students play a role as drivers of social change. The success of environmental education requires collaboration between schools, families, and communities for proper and sustainable waste management (Ratnasari et al., 2019).

Organic waste management can be carried out by applying the 3R method (Reduce, Reuse, Recycle) through composting, liquid fertilizer, and eco-enzyme production. The main concept proposed is to form a waste management team at the school that involves students



and teachers to utilize organic waste from the cafeteria, garden, or food scraps (Elystia et al., 2024). Students will be trained to separate waste, understand the composting process, and innovate in organic waste management, while teachers will act as mentors and facilitators of the activities. In this way, these activities not only benefit the environment but also foster environmental awareness and entrepreneurial spirit among students (Nurkhasanah et al., 2021). This activity aims to raise environmental awareness, reduce the amount of accumulated waste, and produce economically valuable products such as compost that can be sold or used for greening the school environment. Additionally, this activity aims to empower the local economy by utilizing the potential of waste processing. This activity aligns with the principles of the Skills-Based Education Model (MBKM), which focuses on developing students' practical skills. This activity also supports Key Performance Indicators (KPI) that assess the effectiveness of education. Furthermore, this initiative aims to have a positive impact on the local community and strengthen collaboration between schools and the community, with the expectation of benefiting the school environment and regional development.

B. METHODS

SMP Negeri 1 Glagah Lamongan served as a partner in this initiative, which began with an assessment through interviews and direct observation to identify needs related to waste reduction and management. This initiative was carried out during the Kampus Mengajar assignment period from February 26 to June 26, 2024. The approach used in this activity is participatory and educational, emphasizing the active involvement of the entire school community in every stage of the activity, from planning and implementation to program evaluation. Participants in this activity include the principal, teachers, and all students of SMP Negeri 1 Glagah, who serve as both the target audience and active participants in the implementation of the waste management program. The implementation team collaborated with school officials to design a contextual and sustainable program, including awareness campaigns, waste sorting training, and simple waste management practices. Activity evaluations were conducted periodically through observations of changes in school community behavior, participation levels in activities, and increased understanding of waste management. In addition, evaluations were also conducted through discussions and feedback from the school to assess the program's effectiveness and the sustainability of its implementation.



Figure 1: SMP Negeri 1 Glagah
(Source: Personal Documentation)

In the first stage, we conducted observations using a participatory approach, in which researchers were directly involved in the activities being observed. Researchers did not only act as observers but also participated in the activities to gain a deeper understanding of the research subject's situation. Semi-structured interviews were also used as a method that involves a set of questions, but researchers can change the order of questions or delve deeper based on respondents' answers. This was done to identify issues through field observations and brief interviews with several teachers and students (Romdona, et al., 2025). The findings from this session indicate that waste management in schools is still not optimal, with much organic waste remaining unused. Additionally, the existing waste sorting system is inadequate, resulting in organic and inorganic waste being mixed together, leading to accumulation at the school's final disposal site without further processing.



Figure 2: Condition of the Waste Disposal Site at SMP Negeri 1 Glagah

(Source: Personal Documentation)

Based on the findings, the team conducted a second session that included socialization and learning activities for students about various types of waste, the negative consequences of littering, and the benefits of processing organic waste into compost. To convey information in this educational session, a socialization approach was used, in which information about waste management was conveyed verbally to students. Socialization was chosen as the initial method because it facilitates the delivery of material in a structured and comprehensive manner, although it remains passive for the participants. This educational activity plays a crucial role in raising students' awareness about the importance of proper and sustainable waste management (Ratnasari et al., 2019).



Figure 3: Socialization regarding waste management

(Source: Personal Documentation)

The third stage focuses on program implementation, namely the creation of a simple organic waste processing facility in the school area. In this session, students are directly involved in collecting organic waste from the school grounds and food scraps from the cafeteria. The collected waste is then placed in plastic bottles as a medium for composting. These bottles are placed near the medicinal plants grown by students as part of the School Medicinal Plant Program (TOS), so that the composting process directly produces fertilizer for these plants.



Figure 4: Decorate Used Plastic Gallons
(Source: Personal Documentation)



Figure 5: Cleaning Up Trash
(Source: Personal Documentation)

In the final stage, this organic waste management process is combined with filling out the TOS Diary, which is an activity where students document the growth of the plants they have planted. Through this activity, students are not only taught how to document and care for plants, but also indirectly learn about the cycle of organic waste use in a simple way. By witnessing firsthand how waste can be turned into fertilizer, students gain a more meaningful learning experience. Throughout the activity, ongoing guidance and assessment are provided. Assessment is conducted by directly observing plant growth, the success of the composting process, and through casual discussions with teachers and students.



Figure 6: Put the collected waste into gallons
(Source: Personal Documentation)



Figure 7: Diary TOS
(Source: Personal Documentation)

C. RESULTS AND DISCUSSION

The organic waste management program at schools teaches students about the environment in a practical way. Students are directly involved in responding to environmental issues. This program helps shape a caring and responsible attitude towards the environment and encourages critical thinking about sustainability. These activities support context-based learning, which explains the importance of direct experience in understanding scientific and social concepts relevant to everyday life (Sartono, 2021).

The implementation of the organic waste management program also serves to promote environmental awareness throughout the school community. The active involvement of students, teachers, and school officials in this activity creates synergy that reinforces the values of collaboration, cooperation, and shared responsibility for the environment. In addition to the educational aspect, this activity also has social and economic dimensions that can be further developed, such as the use of compost and innovations in recycling waste into valuable products. In this way, the program is not only aimed at reducing waste accumulation but also opens opportunities for the formation of a sustainable circular economy ecosystem within the school environment (Suyanto and Sulastri, 2020; Ministry of Environment and Forestry, 2023).



1.1. Social Impact

The impact of organic waste management activities has had a positive effect on increasing environmental awareness among students and reducing the volume of organic waste in schools. Students showed great interest during the waste collection and processing process. They also began separating waste in their respective classrooms and became accustomed to disposing of waste according to its category. One concrete result of this activity was the creation of a simple composting area, which is now part of the school's routine activities. The compost produced is used to fertilize medicinal plants cared for by students daily, thereby forming a sustainable waste processing cycle with educational value. The formation of this ecosystem creates a more contextual and meaningful learning environment. When students directly participate in the process of converting waste into compost, they not only gain theoretical knowledge but also apply environmental sustainability values.

1.2. Economic Impact

This activity opens up opportunities for the creative economy in the future. The compost produced has the potential to be turned into products with economic value if managed properly. In addition, the use of gallons as planting containers also demonstrates the importance of the principle of reuse (recycling), so that students can realize that even waste can be useful if managed properly. Innovations in utilizing waste, such as turning used plastic bottles into pots for planting media, can be developed into craft products or organic plant packages with market value. This activity also sparks entrepreneurial spirit among students by introducing the concept of a circular economy, where waste is no longer seen as trash but as a resource that can be transformed into products with economic value. This activity also strengthens the bond between students, teachers, and the school community. The collaboration formed in this activity fosters a sense of shared responsibility for the cleanliness and sustainability of the school environment. Through this activity, students are not only encouraged to care for the environment but also trained to become agents of change at home and in the community.

1.3. Efforts to Reduce Waste Accumulation

Organic waste processing activities have reduced the amount of waste that is usually disposed of in landfills. By processing organic waste into compost, the volume of waste disposed of can be significantly reduced, as well as reducing the risk of environmental pollution caused by the decomposition process of waste. This composting process has transformed kitchen waste, food scraps, and leaves into useful products, turning what was once considered worthless waste into something of greater value. Additionally, this activity helps raise awareness among students and the school community about the importance of sorting waste from the start, making waste management more efficient and sustainable. This not only reduces pressure on landfills but also contributes to creating a neat, healthy, and environmentally friendly school environment.

D. CONCLUSION

This activity was carried out at SMP Negeri 1 Glagah through an organic waste management program involving students, and succeeded in having a significant impact on increasing awareness and environmentally friendly practices at the school. Through various steps, starting from initial observations, socialization and learning, waste processing implementation, to recording plant growth in the TOS Diary, students not only gained theoretical knowledge but also directly participated in sustainable practices that support a relevant learning environment. The results of the activity showed that simple organic waste



management has become an effective way to reduce waste volume and also produce compost beneficial for the growth of medicinal plants at the school. The application of the reuse principle by utilizing used plastic gallon containers as planting media also reinforces students' understanding of the importance of innovative and sustainable waste management. This activity aligns with the principles of the Skills-Based Education Model (MBKM), which emphasizes the development of practical skills and real-world problem-solving in the community.

Overall, organic waste management at SMP Negeri 1 Glagah has shown good results in environmental, social, and educational aspects. This program not only reduces the amount of waste disposed of but also changes the views of students and the school community regarding waste management that can be utilized, such as composting and planting media. In this context, students actively participate in every step of the activities, fostering a sense of responsibility and concern for the environment, enabling them to become agents of change both at school and at home. Through simple yet creative organic waste processing methods, this school serves as a concrete example of the sustainable application of the 3R principles (Reduce, Reuse, Recycle), while also paving the way for innovation in the field of creative economy in the future.

The limitations of this organic waste management activity are the lack of supporting facilities, and the sustainability of management could be threatened without regular supervision from teachers and administrators. Therefore, recommendations are needed in the form of improved facilities, such as providing better composters, training for students and teachers, and cooperation with external parties such as environmental communities or local governments. This program must continue so that it becomes a positive culture in schools and part of daily routines, not just a temporary project.

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F. AUTHOR CONTRIBUTIONS

List the contributions of all team members to the community engagement activities and the article writing process. Only authors with contributions should be listed, with their names provided. Activity implementation: SE, MI, Article preparation: SE, MI, Impact analysis: D, MR, SY, Results presentation: SE, MI, Article revision: SE, Other contributions: SE, MI, D, SY, MR.

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