

PRACTICE-BASED ARTICLE



Training on the manufacture of eco-bricks as final waste disposal for village communities

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ABSTRACT

Plastic waste has become a significant challenge in Cikidang Village, primarily due to its high consumption levels and dense economic activities, which cover an area of 1.3 million hectares. To address this issue, this community service project proposes the implementation of the Ecobrick method as an innovative solution. The Ecobrick method involves compressing plastic bottles with plastic waste until maximum density is achieved, transforming waste into functional items such as landfill components and other useful objects. The initiative encompasses direct outreach, training, and practical Ecobrick production, structured into stages that include observation, material collection, hands-on practice, outreach, and results evaluation. The results indicate an enhanced awareness among the community regarding environmental cleanliness and the advantages of Ecobrick. Surveys and interviews reveal positive community responses to the training and outreach, with evaluations suggesting that Ecobrick effectively reduces plastic waste accumulation and improves environmental cleanliness. Furthermore, the program provides opportunities for practical applications of Ecobrick, resulting in substantial positive impacts on waste management and the economic well-being of Cikidang Village.

KEYWORDS

Eco-brick; taining; final waste disposal

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1. Introduction

Currently, solid waste generated from daily human activities and natural processes remains unresolved. As the global population continues to grow, the volume of waste generated also increases (Waste Management Law No. 18 of 2008). If this trend persists, the level of environmental pollution will likely escalate (Andriastuti et al., 2019).

One type of waste that poses significant challenges is plastic waste, a macromolecule formed through the polymerization process. Polymerization involves the chemical combination of simple molecules (monomers) into larger molecules (polymers or

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macromolecules) (Nurhalisa & Nawawi, 2023). Consequently, the smelting process for plastic waste is inherently time-consuming. Furthermore, due to its durability and resistance to decomposition, plastic waste has the potential to spread rapidly if not managed effectively.

Cikidang Village, situated within the Cikidang District with an area of 1,300,000 hectares, possesses abundant natural resources and human resources potential. The village's high level of production and consumption, particularly in the form of plastic packaging, contributes to the accumulation of plastic waste. Moreover, the village's tourism potential, supported by its natural resources, has led to an increase in tourist visits, further exacerbating the volume of plastic waste.

Daily, the village community collects a substantial amount of plastic waste. However, this high level of consumption is not adequately balanced with the village's waste management capabilities. Consequently, the processing methods available are primarily limited to incineration, which is further constrained by the limited number of Final Disposal Sites available within the village.

Waste management remains a persistent challenge in Indonesia, with recent data indicating a concerning rise in per capita plastic waste production. The latest figures reveal that each Indonesian individual generates an average of 0.9 kilograms of plastic waste per week, a significant increase attributed to urbanization and growing consumer spending power (Borrelle, et al. 2020).

Statistical data from the 2021 National Waste Management Information System (SIPSN) reveals that plastic waste ranks second only to culinary organic waste in terms of volume generated in Indonesia. Plastic's ubiquity in daily life has led to an estimated production of approximately 25.95 million tons of plastic waste in 2021, accounting for 15.96% of the total waste generated (SIPSN, 2021).

The government must address these pressing issues through the implementation of effective regulations to optimize plastic waste management. One notable initiative in this regard is the Ecobrick project.

Ecobricks, a combination of the words "eco" and "brick" in English, literally translates to "eco-friendly brick." These are plastic bottles filled with various types of plastic waste until they reach maximum density (Nursindi & Lismaya, 2023). The primary objective of using Ecobricks is not to eliminate plastic waste but rather to extend its lifespan and repurpose it into functional objects for human reuse (Suryafiansyah, et al., 2023). Furthermore, Ecobricks can be assembled into diverse functional items, including garbage dumps, tables, chairs, and various other objects (Silviana, et al., 2024; Tanahomba, et al., 2024; Najmia et al., 2024; and Febriyan, et al., 2024).

In addition to this, the economic potential of utilizing Ecobricks within the village community can be harnessed to establish a Recycling Village. This venture has the

potential to transform into an entrepreneurial field, specializing in the production of modular furniture crafts. Furthermore, the utilization of Ecobricks as a recycling infrastructure holds the promise of enhancing the overall economic well-being of the community (Nurhalisa & Nawawi, 2023; Shahan, 2024; Sena Gökür & Kalfa, 2024).

Given this background, there is an urgent need to enhance the knowledge and skills of the community in Cikidang Village regarding plastic waste management. Specifically, the community requires the capacity to process plastic waste into Ecobricks, which can serve as a viable alternative in the construction of Final Disposal Sites facilities. These endeavors are crucial in improving waste management systems at the local level and supporting the attainment of a cleaner and more sustainable environment.

2. Methods

Based on initial observations and references from various related journals, the author recommends the application of Eco-bricks as a solution to the problem of plastic waste in Cikidang Village. Eco-bricks are a method of utilizing plastic waste to create useful and reusable items. This technique involves filling plastic bottles with plastic waste until the bottle is filled. By doing so, existing plastic waste can be effectively managed and repurposed as a material in the production of Eco-bricks, thereby contributing to the reduction of plastic waste accumulation in the environment.

Based on the problems described earlier, the approach of community service and empowerment programs to support the use of plastic waste into useful goods can be implemented through training programs and the manufacture of Eco-bricks as a means of waste management, as well as efforts to reduce plastic waste in villages. The program is designed in three main stages (Kerzner, 2017), namely: (1) Implementation Coordination: This initial stage involves planning and coordination between all relevant parties to ensure the smooth implementation of the program. This includes scheduling activities, organizing resources, and communicating with the parties involved. (2) Implementation: At this stage, the program will be implemented according to the plan that has been prepared. This activity includes training to the community on Eco-bricks making techniques, plastic waste collection and processing, and the making of Eco-bricks themselves. (3) Evaluation of Activity Results: The final stage involves evaluation to assess the effectiveness and impact of the activities that have been implemented. This evaluation includes an assessment of the achievement of program objectives, identification of challenges faced, and recommendations for future program improvement and development. By following these stages, it is hoped that the program can succeed in improving community skills in plastic waste management and reducing waste accumulation in the village.

The community service method employed involves a direct practice approach and community socialization. This approach was selected as the most appropriate for the work program designed by the group. In addition to hands-on practice, the program also includes training focused on socialization. Socialization is a crucial component of the program's implementation phase, with the objective of introducing Eco-brick products to the community. Through socialization, the community is expected to acquire new knowledge regarding plastic waste processing.

The program implementation stages are as follows: observation, material collection, direct practice, socialization, and conclusion preparation. Each of these stages is an integral component of a comprehensive work program aimed at the creation of Eco-bricks. These stages are designed to ensure the success of plastic waste management initiatives.

3. Results and discussion

In this community service and empowerment activity, the author engaged in direct socialization with the residents of Cikidang Village, emphasizing the significance of maintaining environmental cleanliness and health. Additionally, the author provided knowledge on transforming plastic waste into products with practical value and societal benefits.

The author recognized that addressing the plastic waste challenge necessitates a gradual approach to solution. This strategy aims to foster the development of more effective solutions to mitigate the environmental impact of plastic waste. Through socialization and education, the community is empowered to comprehend and implement practical waste management strategies, contributing to a cleaner and healthier environment. The proposed solution for this community service and empowerment activity involves recycling plastic waste utilizing the Ecobrick method. Furthermore, the author conducted direct practice and training, resulting in the production of Final Disposal Site products that were subsequently stored in various locations within the village.

In the implementation of this community service and empowerment activity, all group members and relevant parties collaborated with the residents of Cikidang Village to encourage their participation in addressing the plastic waste challenge through the Eco-brick method.

During the implementation period spanning from the initial week to the final week, group members and related parties actively engaged in plastic waste collection activities within the surrounding environment of Cikidang Village. Once enough plastic waste has been collected, the subsequent process involves collecting, sorting, and cleaning the

waste. This process culminates in the packaging of plastic waste into uniformly sized plastic bottles, ensuring that each bottle is filled to capacity and solid. As illustrated in [Figure 1](#).



Figure 1. Direct plastic waste collection process

The next activity, the entire community gathered to carry out training and socialization activities related to Eco-brick makers. By bringing all the materials that have been prepared in advance as depicted in [Figure 2](#), the community is introduced first to the use of Eco-bricks, the benefits and economic potential that can be produced. After that, the community is guided to make Eco-bricks which will later be prioritized as landfills as depicted in [Figure 3](#). All communities convened to engage in discussions and consultations regarding alternative methods to the utilization of Eco-bricks. Additionally, they sought to gather community feedback on the socialization activities conducted, as depicted in [Figure 4](#).



Figure 2. The drying process after washing plastic waste



Figure 3. The process of putting plastic waste into bottles



Figure 4. The process of counseling and socialization directly to the community

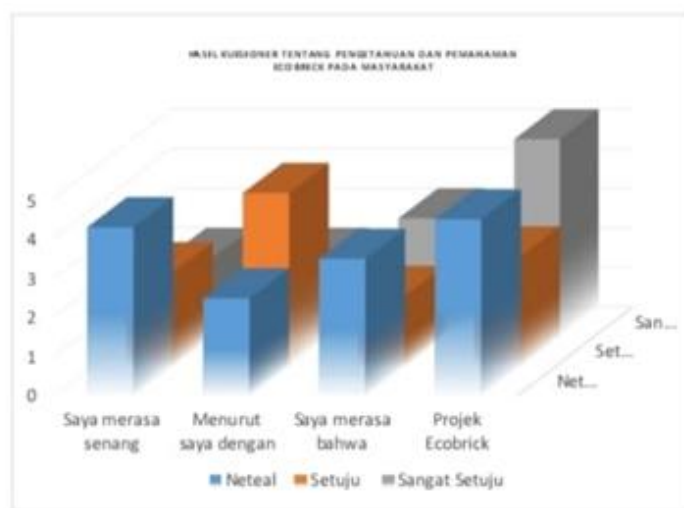


Figure 5. Results of the questionnaire on community response to Ecobricks

Furthermore, the author conducted interviews with several trainees to gather insights. The findings from these interviews in [Figure 5](#) revealed positive community

responses regarding plastic waste management beyond its traditional use as a landfill. Plastic waste can also be repurposed for various purposes, such as creating flowerpots and enhancing the aesthetics of the yard. The comprehensive analysis of questionnaires and interviews conducted during this training activity has provided valuable insights and demonstrated positive impacts on the community, particularly in fostering waste management awareness and insights. In [Figure 6](#), the outcomes of constructing a final waste disposal site that implements the principle of waste utilization into Eco-bricks are presented.



Figure 6. Eco-bricks

4. Conclusion

Community service and empowerment initiatives in Cikidang Village have successfully raised awareness regarding the significance of environmental cleanliness and the utilization of plastic waste through the Eco-brick method. The socialization and direct training conducted have fostered community participation in effectively managing plastic waste. The Ecobrick method, which involves collecting, sorting, cleaning, and compressing plastic waste into bottles, has demonstrated its practicality in reducing the accumulation of plastic waste and producing useful products such as landfills.

The findings of the questionnaire and interviews revealed a favorable response from the community, with numerous participants affirming the potential of Eco-bricks to diminish the plastic waste population and enhance environmental hygiene and health. Furthermore, this program presents opportunities for the community to explore the utilization of Eco-bricks in diverse applications, including flowerpots and home decorations. Overall, this activity has had a substantial positive impact on plastic waste management and environmental awareness within Cikidang Village.

The authors contend that the community service program lacks several deficiencies, particularly in addressing the waste problem in Cikidang Village, which remains insignificant. It is hoped that the community empowerment program focused on waste management will introduce novel approaches to waste management.

Disclosure statement

The authors declare that there is no conflict of interest regarding the publication of this paper.

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References

- Andriastuti, Bella Tri., & Arifin., Laili Fitria. (2019). Potensi Ecobrick Dalam Mengurangi Sampah Plastik Rumah Tangga Di Kecamatan Pontianak Barat. *Jurnal Teknologi Lingkungan Lahan Basah*, Vol. 07, No. 2, 2019: 055 – 063. <https://doi.org/10.26418/jtlb.v7i2.36141>
- Borrelle, S. B., Ringma, J., Law, K. L., Monnahan, C. C., Lebreton, L., McGivern, A., ... & Rochman, C. M. (2020). Predicted growth in plastic waste exceeds efforts to mitigate plastic pollution. *Science*, 369(6510), 1515-1518. <https://doi.org/10.1126/science.aba3656>
- Febriyan, M. I., Hasyim, M. A., Zahro, S., Fauziah, A. N., & Rohana, S. (2024). Sosialisasi dan Pelatihan Pengolahan Limbah Plastik Melalui Ecobrick. *WIKUACITYA: Jurnal Pengabdian Kepada Masyarakat*, 3(2), 203-208. <https://doi.org/10.56681/wikuacity.v3i2.219>
- Kerzner, H. (2017). Project management: A systems approach to planning, scheduling, and controlling. John Wiley & Sons. <https://www.projectsmart.co.uk/white-papers/quick-guide-to-project-management.pdf>

- Najmia, S. L., Wulandari, S., & Salsabila, R. S. (2024). Optimizing Plastic Waste Reduction through Education and Ecobrick Implementation in Penjalin Village. *Dinamika Sosial: Jurnal Pengabdian Masyarakat dan Transformasi Kesejahteraan*, 1(3), 95-105. <https://doi.org/10.62951/dinsos.v1i3.530>
- Nurhalisa, S., & Nawawi, Z. M. (2023). Analysis of Ecobrick Economic Potential in Improving Community Economic Welfare: Case Study of Bukit Lawang Plantation, Kab. Langkat. *JESI (Jurnal Ekonomi Syariah Indonesia)*, 13(1), 95-104. <https://doi.org/10.62951/dinsos.v1i3.530>
- Nursindi, M., & Lismaya, L. (2023). Pemanfaatan sampah plastik dengan metode ecobrick sebagai upaya mengurangi limbah plastik di Desa Sindangpanji, Kec. Cikijing, Kab. Majalengka. *COMSERVA: Jurnal Penelitian dan Pengabdian Masyarakat*, 3(4), 1404-1410. <https://doi.org/10.59141/comserva.v3i4.898>
- Sena Göknur, K. O. Ç., & KALFA, S. M. (2024). Eco-Bricks In The Framework Of The Integration Of The Concept Of Eco-Design Into Architecture. <https://www.researchgate.net/profile/Sena-Koc-2/publication/380467900>
- Shahen, M. A. (2024). The Tendency of Eco-Brick Uses in Bangladesh: Current Trends and Future Needs. *International Journal of Sustainable Rural Development*, 1(1), 33-44. <https://doi.org/10.56556/jescae.v3i4.1033>
- Silviana, S., Rochmah, L. R. L., Suprastiyo, S., Wahyuni, T., Firnanda, I., Rahmawati, S., ... & Ikhtisholiah, I. (2024). Pemanfaatan Sampah Plastik di Desa Pongangan Menjadi Ecobrick. *GOTAVA Jurnal Pengabdian Kepada Masyarakat*, 2(1), 59-63. <https://doi.org/10.59891/jpmgotava.v2i1.14>
- SIPSN. No Title. 2021.
- Suryafiansyah, Z., Cahyaningtyas, A. D., Nahdiah, A., Wulandari, E., Aulia, N., & Santjoko, H. (2023). Pembuatan Ecobrick Sebagai Upaya Pengurangan Sampah Plastic di Dusun Pangukan Kecamatan Tridadi Kabupaten Sleman. *Indonesian Journal of Public Health*, 1(2), 137-143. <https://jurnal.academiacenter.org/index.php/IJOH/article/view/19>
- Tanahomba, A. K., Kalaway, P., Dillu, A., Ghudi, Y. N., Bunggih, A. U., Ndjoeroemana, Y., & Bano, V. O. (2024). The Optimization of Ecobrick Plastic Waste Into Chairs and Tables at Hamu Pangia Orphanage, East Sumba. *GANDRUNG: Jurnal Pengabdian Kepada Masyarakat*, 5(2), 1750-1759. <https://doi.org/10.36526/gandrung.v5i2.3862>