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COMMUNITY EMPOWERMENT THROUGH THE UTILIZATION OF PLASTIC WASTE INTO ECOBRICKS AS AN EFFORT TO REDUCE PLASTIC WASTE IN SIKALANG VILLAGE, SAWAHLUNTO, WEST SUMATRA

PEMBERDAYAAN MASYARAKAT MELALUI PEMANFAATAN SAMPAH PLASTIK MENJADI ECOBRICK SEBAGAI UPAYA MENGURANGI LIMBAH PLASTIK DI DESA SIKALANG, SAWAHLUNTO, SUMATERA BARAT

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Abstract

This community service research focuses on empowering the Sikalang Village community in household plastic waste management through ecobrick creation, serving as a concrete solution to reduce waste and preserve the ecosystem. Conducted over 30 days (June 17 - July 17, 2025) using a Participatory Action Research approach, the activities encompassed planning, door-to-door socialization, plastic waste collection and compaction into bottles, and the assembly of ecobricks into the "SIKALANG" village sign, followed by evaluation and monitoring. The findings reveal a significant increase in community awareness and participation, with a drastic reduction in plastic waste accumulation and the creation of valuable products. This success

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demonstrates that direct community involvement in waste management is more effective, while also providing productive avenues for residents. Therefore, such empowerment initiatives are highly recommended for broader implementation to achieve a clean and prosperous environment through self-managed waste.
Keywords: Ecobrick, Plastic Waste Management, Community Empowerment, Life of Land

Abstrak

Penelitian pengabdian masyarakat ini berfokus pada pemberdayaan masyarakat Desa Sikalang dalam pengelolaan sampah plastik rumah tangga melalui pembuatan *ecobrick*, sebagai solusi konkret untuk mengurangi limbah dan menjaga ekosistem. Dilaksanakan selama 30 hari (17 Juni - 17 Juli 2025) dengan pendekatan *Participatory Action Research*, kegiatan ini melibatkan perencanaan, sosialisasi *door-to-door*, pengumpulan dan pemadatan sampah plastik ke dalam botol, hingga perakitan ecobrick menjadi plang nama desa "SIKALANG", diikuti evaluasi dan monitoring. Hasilnya menunjukkan peningkatan signifikan kesadaran dan partisipasi masyarakat, dengan tumpukan sampah plastik yang berkurang drastis dan terciptanya produk bernilai guna. Keberhasilan ini membuktikan bahwa keterlibatan langsung masyarakat dalam pengelolaan sampah lebih efektif, sekaligus memberikan sarana produktif bagi warga. Oleh karena itu, pemberdayaan semacam ini sangat direkomendasikan untuk digalakkan lebih luas guna mencapai lingkungan yang bersih dan sejahtera melalui pengelolaan sampah mandiri.

Kata kunci: *Ecobrick*, Pengelolaan Sampah Plastik, Pemberdayaan masyarakat, Menjaga Ekosistem Darat

1. INTRODUCTION

Humans cannot be separated from the use of plastics in their daily lives. According to data from the Indonesian Waste Management Information System, the total amount of waste in Indonesia in 2022 is projected to reach 68 million tons, with plastic waste estimated to account for 18.90% of the total. Plastics in Indonesia are extensively used for packaging, automotive purposes, and other applications (Majida et al., 2023). This is evidenced by the widespread use of plastic packaging for various products, including food, beverages, basic necessities, and even protective packaging for electronic products (Malihah et al., 2024). According to data from BUMN (2023), 34.88% of plastic consumption in Indonesia is used for packaging, whereas plastic use for automotive and construction purposes accounts for only 22.26%. These plastics are mostly single-use plastics, which can accumulate as waste that is difficult to decompose through microbial activity (Yudiyanto et al., 2019).

High plastic consumption significantly contributes to the increase in waste generation (Yona et al., 2020). Plastic waste is the second-largest contributor to waste production in Indonesia after food and beverage waste, according to BPS data in 2022, and therefore has the potential to be a major source of environmental pollution (Directorate of National Resilience Statistics, 2023). Plastic pollution is not limited to land; the Ministry of Environment and Forestry reports that plastic waste is a leading contributor to marine ecosystem pollution, accounting for 35.41%. This indicates that if not managed properly and promptly, plastic waste could threaten human civilization (Meyrena & Amelia, 2020).

The government, through the Ministry of Environment and Forestry (KLHK), has long established regulations and policies for waste management based on the principles of reuse, reduce, and recycle, as outlined in Law No. 18 of 2008 on Waste Management. Additionally, the government has implemented initiatives to manage and reduce plastic waste, such as paid

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plastic bag policies and even bans on single-use plastics, which have been in effect in Jakarta since July 1, 2020 (BUMN, 2023). However, as observed, the issue of plastic waste has not yet been effectively and comprehensively resolved. Communities still use single-use plastics for bags and packaging, often citing affordability and convenience (Nurazizah et al., 2021). Therefore, addressing plastic waste requires commitment and awareness from the community itself.

Effective waste management can begin at the household level, which represents the smallest community unit (Istirokhatun & Nugraha, 2019). Households capable of managing their plastic waste properly are expected to reduce the accumulation of plastic waste and environmental pollution in their surroundings. One form of plastic waste management promoted by community service students is the transformation of plastic waste into ecobricks. Ecobricks are chosen as a means to directly empower communities in managing their plastic waste. This approach allows communities not only to contribute directly to preserving soil ecosystems by managing waste but also to create valuable products (Ningrum et al., 2022).

Sikalang Village is located in Talawi District, Sawahlunto City, West Sumatra Province. The village consists of four hamlets: Kemiri, Tarandam, Bukir Sibanta, and Muaro Jaya. The village is rich in coal resources, and most household heads work as miners. Housewives in the village are active in PKK activities, which also include utilizing organic waste as fertilizer for Dasawisma plants. However, the handling of inorganic waste, such as plastic, is still poorly understood and recognized by the residents of Sikalang Village, as they often dispose of waste into rivers, accumulate it at landfills, or even burn household waste in their yards.

The Community Service Program (KKN) is a community-based service activity conducted by students, based on the principles of Community Empowerment Learning (PPM). The KKN PPM program is coordinated by the Institute for Community Service (LPPM) of Universitas Negeri Padang. This activity aims to promote development, socialization, and community participation in the development process. One of its key initiatives is to socialize a program for transforming plastic waste into ecobricks. This program aims to reduce plastic waste, educate the community on the utilization of plastic waste for valuable purposes, and contribute to the preservation of soil ecosystems.

2. COMMUNITY SERVICE METHOD

The community service activity entitled *"Community Empowerment Through the Utilization of Plastic Waste into Ecobricks as an Effort to Reduce Plastic Waste in Sikalang Village"* was conducted in Sikalang Village, Talawi District, Sawahlunto City, West Sumatra Province. This activity took place during the KKN period from June to December, specifically from June 17 to July 17, 2025.

This community service employed a Participatory Action Research (PAR) approach, which is oriented toward community empowerment. This approach emphasizes the development and mobilization of knowledge within the community so that residents can become agents of change, rather than mere recipients of service, with students and supervising lecturers serving only as facilitators (Afandi et al., 2022). In the context of community service, the term *method* refers to the pattern or system of actions to be carried out, or the sequence of stages required to implement the service activities (Murdjito, 2012). Accordingly, this community service activity was conducted in several stages.

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The first stage was planning. This began with the formation of the service team, consisting of Field Supervising Lecturers (DPL) and student volunteers. The team then conducted a site survey to map the social conditions of the community and collect data on local problems and potential resources. Next, the team adjusted the program to align with the needs and issues of the village. The team then coordinated with the village government and community members regarding program permissions. Finally, all materials, tools, and other resources needed for the service activities were prepared.

The second stage was implementation. Implementation began with the send-off of the service team by the university and the handover of students to the target village, Sikalang. The community service was conducted over a 30-day KKN period, from June 17 to July 17, 2025. During the first week, the team focused on door-to-door socialization regarding the utilization of plastic waste into ecobricks for all residents of Sikalang Village. The door-to-door method was chosen because it allows for broader coverage, ensuring that education reached the community thoroughly. In the second week, student volunteers collaborated with the community to collect pre-sorted plastic waste from households and the surrounding areas. In the third week, they cut the plastic waste into small pieces and placed them into plastic bottles. By the fourth week, students and community members painted the ecobrick bottles and assembled them into the planned structures.

The final stage was evaluation and monitoring, carried out by the DPL together with the village authorities of Sikalang. This stage aimed to refine the activities conducted and address any shortcomings. It also served as the final stage of the community empowerment-based service in Sikalang Village, carried out in the fifth week. Subsequently, the service team prepared a report on the results of the community service, which was submitted to the village head and the DPL.

3. RESULTS AND DISCUSSION

Results of Community Empowerment

This section describes and discusses the results of the community empowerment activities. The service was conducted in the form of community empowerment over 30 days, divided into 5 weeks during the UNP KKN period from July to December, specifically from June 17 to July 17, 2025. Participants in this program were the residents of Sikalang Village, primarily the 30 PKK housewives, representing the target community.

The first week of the program, from June 17 to June 22, 2025, involved door-to-door socialization with the residents of Sikalang Village. The second week, from June 23 to June 29, 2025, focused on collecting plastic waste from the village surroundings. The third week, from June 30 to July 6, 2025, involved filling plastic bottles with compacted pieces of plastic waste. The fourth week, from July 7 to July 13, 2025, was dedicated to painting and assembling the plastic bottles into ecobricks. The fifth week, from July 14 to July 17, 2025, was allocated for evaluation and monitoring by the DPL and village officials.

The community empowerment team consisted of one Field Supervising Lecturer (DPL) and 40 student volunteers.

During the first week, the team began the empowerment process by socializing the dangers and impacts of plastic waste as well as methods for managing and transforming plastic waste into valuable products. The door-to-door approach was employed to ensure comprehensive outreach to the target community. This socialization process lasted for six days, conducted in rotation across the four hamlets of Sikalang Village. During the sessions, the team

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also encouraged residents to avoid littering and to sort household waste, particularly plastics. Additionally, the team conducted a small demonstration on how to make ecobricks from community plastic waste to spark interest and curiosity among the residents.

Figure 1: Door-to-Door Socialization on Utilizing Plastic Waste into Ecobricks

In the second week, the community service team began collecting plastic waste door-to-door, as well as gathering plastic waste present in the Sikalang village environment. This stage took place from June 23 to June 29, 2025, by visiting homes and surroundings in the four hamlets of Sikalang village. This phase served as the initial empowerment stage, aimed at educating the residents of Sikalang village on waste sorting and utilizing the collected waste to create more useful products. This stage also helped clean the village environment from plastic waste, making it cleaner and more organized.

Figure 2: Plastic Waste Collection

In the third week, community empowerment was carried out by guiding residents to insert small pieces of plastic waste into 600 ml plastic bottles. This stage took place from June 30 to July 6, 2025, at the Sikalang Village Community Hall (GPM) and the student service post. During this stage, the service team, together with the community, began compacting the plastic pieces into used plastic bottles. Each 600 ml bottle could hold approximately 50–70 grams of plastic waste, allowing residents to accurately practice this stage alongside the student service team.

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Figure 3: Compacting Plastic Waste Pieces into Used Plastic Bottles

The fourth week focused on painting and assembling the ecobrick bottles. Painting was done to make the ecobricks more colorful and visually appealing. In agreement with the village authorities, the ecobricks were assembled into a village name sign reading "SIKALANG." This stage was carried out from July 7 to July 13, 2025.

This process transformed plastic waste, which was initially merely polluting the environment, into a valuable and functional product. Generally, besides being assembled into name signs, ecobricks can also be used to create chairs, tables, garden beds, or plant pots. The assembly of the ecobrick sign involved a welded iron frame forming the letters "SIKALANG." The ecobrick sign serves as a reminder to the community that properly managed plastic waste can be turned into useful products. In addition to marking the boundary between Sikalang village and neighboring villages, the sign also represents the creative outcome of the community empowerment program carried out by UNP KKN students in 2025.

Figure 4: Ecobrick Painting and Assembly

In the fifth week, the evaluation and monitoring stage was carried out by the Supervising Lecturer (DPL) and village officials. This stage took place from July 14 to July 17, 2025, aiming to monitor the progress of the UNP student community service program, including the community empowerment activities through the utilization of plastic waste into ecobricks.

The DPL, together with the village officials, also evaluated the activities that had been conducted to ensure that the outcomes of the community service aligned with the expectations of the residents. During this stage, the student volunteers reviewed and improved all aspects of the KKN activities, including the ecobrick project. The students, along with the village officials and community members, participated in the inauguration of the "SIKALANG" village name sign.

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Discussion

After presenting the results of this empowerment program, we, the student volunteers, can conclude that community empowerment through the utilization of plastic waste into ecobricks in Sikalang village successfully enabled residents to manage their household plastic waste. The community of Sikalang showed great enthusiasm in participating in the empowerment activities from the first week to the fifth week. The village authorities also supported the community in continuously innovating by turning plastic waste into valuable ecobrick products.

The results of this community empowerment also demonstrate that direct community involvement in waste management is more effective than merely relying on government regulations or policies without engaging the residents. This empowerment program also provided productive activities for the elderly in Sikalang village, resulting in valuable products. Consequently, the community was able to develop their creativity and innovate through ecobrick production.

After five weeks of community empowerment in Sikalang village, the student volunteers observed a significant reduction in accumulated plastic waste. As reported by Andriastuti et al. (2019), the total amount of plastic waste that can potentially be converted into ecobricks reaches 652,306 tons per year. Therefore, empowering communities to process plastic waste into ecobricks offers an effective solution for waste management and helps reduce waste accumulation on both small and larger scales.

Moreover, the community of Sikalang gained understanding and education about how improperly managed plastic waste can cause various forms of pollution and environmental hazards. Empowerment is not only about enabling the community but also serves as a practical solution that can be considered by the government in managing the increasing volume of plastic waste. Through this program, a cleaner and more prosperous environment can be achieved, and various forms of pollution can be mitigated.

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4. CONCLUSION

Based on the results of the 30-day community empowerment program, it can be concluded that empowering the community through the utilization of plastic waste into ecobricks in Sikalang village has raised awareness among residents that proper plastic waste management can help address environmental issues. Through this program, the community was able to transform their household plastic waste into valuable products made from ecobricks. As a result, residents directly participated in tackling pollution and managing waste effectively. Therefore, the student volunteers recommend that the government continue to promote this empowerment program to all communities, including those in remote villages, as the key to solving the waste problem lies in actively involving the community in managing their waste independently.

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