

## Community Service Based on Recycling: Transforming Plastic Bottles and Sawdust into a Recycled Table

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### ABSTRACT

Higher education institutions have a strategic role in community service, one of which is implemented through the Community Service Program (KKN). This program was carried out by students of Universitas Negeri Surabaya in Kraton Village, Magetan Regency, focusing on recycling plastic waste into a functional table. The method included observing potential waste materials and practicing table-making, starting from filling bottles with sawdust, arranging them, painting, and finishing with a decorated plywood base. The results show that the recycled table functions as a floor-seating dining table that is not only functional and aesthetic but also attracts visitors' attention. This activity contributes to reducing plastic waste accumulation, minimizing harmful burning practices, and raising community awareness of sustainable waste management for holistic empowerment that integrates environmental, social, and economic solutions.

### Keywords

*Community Service, KKN, Plastic Waste, Ecobrick, Sustainability*

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## INTRODUCTION

Higher education institutions play an important role within the framework of national development. Higher education carries several functions, namely as producers of human resources capable of meeting societal needs, as well as advancing, disseminating, and developing science and technology itself (Bungai & Perdana, 2018). In short, higher education must be able to implement the *Tri Dharma*, namely education, research, and community service. To fully realize this role, each aspect of the *Tri Dharma* complements

one another and cannot be separated. Education will produce qualified and productive human resources, research encourages innovation and develops knowledge (Dung, 2021; Trinh, 2023). The bridging between research and education is carried out through the implementation of community service. Community service is a strategic pillar that affirms the relevance of higher education in society (Bungai & Perdana, 2018). Through community service, the results of education and research do not merely remain at the academic level but are disseminated in a tangible way to address the needs, challenges, and problems of society (Berchin et al., 2021). To fully realize the role of the *Tri Dharma* of higher education, the outcomes of education and research need to be bridged through community service activities. One concrete form of such activity is the Community Service Program (*Kuliah Kerja Nyata* or KKN), which serves as a means for students to implement their knowledge while directly engaging with societal issues.

The *Kuliah Kerja Nyata* (KKN) program is one of the community service initiatives of higher education institutions in maximizing the implementation of the *Tri Dharma*, especially for students. KKN serves as a forum for agents of change, empowering students through direct involvement in the field and collaboration with the community (Sukardi et al., 2024). In this regard, Universitas Negeri Surabaya, as one of the state universities in Indonesia, has implemented a thematic KKN program supervised and coordinated by the Institute for Research and Community Service (LPPM). This KKN activity was carried out in Kraton Village, Magetan Regency, with the aim of recycling plastic waste into value-added products. Recycling is not only a method of disposing of plastic waste but also an effective process to minimize the need for new plastic, which can help reduce global warming (Dayamanti 2022). Therefore, this study seeks to present the community service efforts of Unesa KKN students in transforming plastic waste into higher-value products.

## METHODS

This KKN activity was carried out to increase the usability of plastic waste in November 2023 in Kraton Village, Magetan Regency. The target groups involved were members of the tourism awareness group (*Pokdarwis*) and visitors of the Sendang Kamal Cultural Heritage. The implementation activities involved several stages, namely:

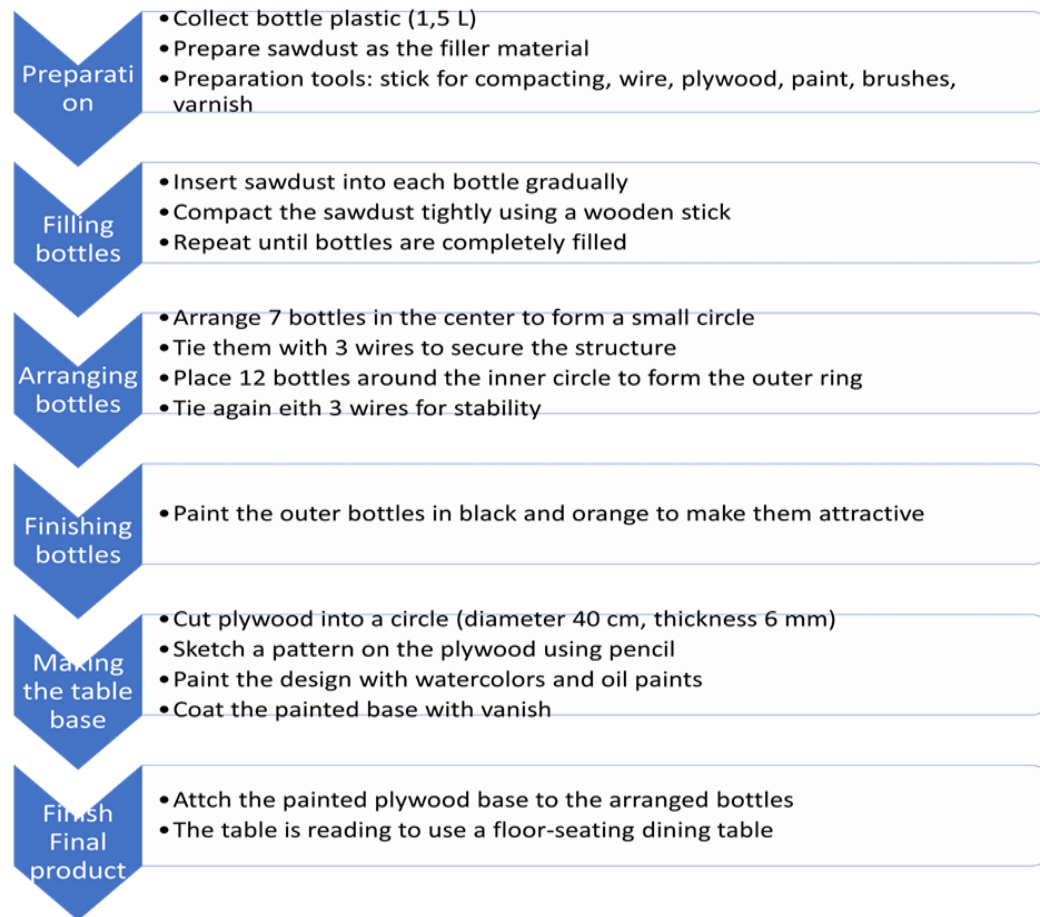
1. **Observation stage:** This stage began with direct field observations to identify waste with potential for recycling, namely used bottles and sawdust.
2. **Preparation stage of tools and materials:** This stage prepared the facilities and infrastructure supporting the implementation of activities, including the production site, bottles, sawdust, wire, scissors, oil paint, water-based paint, plywood, brushes, and other supporting materials.
3. **Implementation stage of activities:** Conducted through a practical method together with the community. The Ecobrick table was made by filling 1.5 L plastic bottles with sawdust compactly, arranging 7 bottles in the inner circle and 12 bottles in the outer circle tied with wire, painting the outer part of the bottles, attaching a 40 cm diameter decorated plywood base, and finally using it as a *lesehan*-style dining table.

## RESULT AND DISCUSSION

Students of Universitas Negeri Surabaya carried out a series of community service activities beginning with the observation stage, where it was found that used bottles had become an unresolved waste problem in Kraton Village, Magetan, East Java. Moreover, plastic is a type of waste that is difficult to decompose naturally (Dey et al., 2024). Excessive consumption of plastic poses a planetary threat, affecting nearly every marine and freshwater ecosystem (Borrelle et al., 2020). Plastic contributes to environmental degradation and

exacerbates climate change issues, not only by worsening waste management and landfill problems but also because its incineration releases carbon dioxide and dioxins into the atmosphere (Sharma & Neelam, 2023; Wojnowska-Baryła et al., 2022). Therefore, recycling plastic bottle waste into tables has become an innovative solution to address environmental pollution caused by plastics. There are six stages in the process of making tables with plastic bottles, namely: preparation, filling bottles, arranging bottles, finishing bottles, making the table base, and finishing production (see Figure 1).

The preparation stage consisted of providing a set of 1.5-liter bottles arranged from 19 bottles in a circular formation. These bottles were previously filled with sawdust. The sawdust was inserted into the bottles gradually while being compacted using a wooden stick. Once the required number of bottles was prepared, the bottles were arranged. In the inner part, 7 bottles were arranged to form a small circle and tied together with three wires. This was followed by the outer circle, which used 12 bottles. Similar to the inner part, the outer circle was also tied together with three wires.



**Figure 1.** Stage Ecobrick

When the assembly stage was completed, it continued with the finishing stage, which involved painting the outer circle of bottles with colors to make them more attractive. The colors used were black and orange. For the base, the material used was plywood with a thickness of 6 mm. The plywood was cut into a circular shape with a diameter of 40 cm. To make the base more appealing, it was decorated with a unique design. The painting process began with drawing a sketch or desired pattern using a pencil, which was then colored with watercolor and oil paint. In the final stage, the painted base was coated with varnish to ensure the paint lasted longer when placed outdoors. This table was designed to function as a low dining table with a floor-seating concept. Such a dining table would undoubtedly appear more attractive and capture the attention of visitors when choosing a place to enjoy their meals.

(Gong et al., 2023), in his research, stated that emotions concerning environmental degradation influence tourists' interest in visiting destinations that strive to protect the environment. This also brings a positive impact by inspiring visitors who may wish to create their own ecobrick tables at home.



**Figure 2.** Processing Ecobrick

The community service activity conducted through the Community Service Program (KKN) in Kraton Village, Magetan Regency, demonstrates the strategic role of universities in disseminating knowledge while simultaneously addressing environmental issues in society. The main problem faced by this village is the accumulation of plastic waste, particularly used bottles, which are difficult to decompose naturally and potentially harmful to the environment if burned or discarded carelessly. Through a creative approach, the students initiated a solution by utilizing used plastic bottles and sawdust to produce an innovative eco-friendly product.

## CONCLUSION

The Thematic Community Service Program (KKN-Tematik) conducted in Kraton Village, Magetan, demonstrates that universities play an important role in bridging education and research through community service. The utilization of plastic bottles and sawdust into an Ecobrick Table serves as a tangible example of how simple innovations can generate positive environmental impacts while raising community awareness. The process, which involved observation, preparation, joint practice with the community, and finishing stages, resulted in a creative product that is not only functional as a floor-seating dining table but also aesthetically appealing. The positive responses from the community and visitors prove that this activity successfully inspired better waste management practices, reduced pollution, and encouraged the creation of a cleaner and more sustainable environment. Thus, this activity not only provides practical benefits but also serves as a medium for education and community empowerment in plastic waste management.

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