



## Assistance in Processing Polyethylene Terephthalate (PET) Strapping Waste into Economically Valuable Handicrafts for The Community of Dayu Village, Gondangrejo Subdistrict, Karanganyar Regency

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### Abstract

Dayu Village, located in Gondangrejo Subdistrict, Karanganyar Regency, faces challenges in infrastructure development and area management, alongside high unemployment rates and low community skills. To address these issues, a community service activity was conducted with the aim of providing assistance in processing polyethylene terephthalate (PET) strapping waste into economically valuable handicrafts to enhance residents' skills and income. The implementation method included pre-activity coordination with village government and community members, direct training in crafting products from PET waste, and evaluation and follow-up through discussions and aspiration gathering. The activity was attended by 19 participants who successfully produced marketable waste basket crafts. This initiative opened opportunities for Dayu Village residents to earn additional income through PET strapping waste processing. The high enthusiasm and hope expressed by participants indicate a desire for the activity to continue as a sustainable economic empowerment program in Dayu Village.

## 1. Introduction

Dayu Village, located in Gondangrejo Subdistrict, Karanganyar Regency, is known as a historical tourism area due to the presence of the Dayu Archaeological Museum. However, beyond the museum, there is untapped potential for natural tourism, notably at Cemoro Pitu Peak. This site offers beautiful natural panoramas, including views of Mount Lawu and the cityscape of Surakarta from an elevated vantage point. The presence of a pavilion in this area also provides opportunities for developing multifunctional spaces for educational and social community activities.

Unfortunately, the current condition of Cemoro Pitu Peak still requires spatial arrangement and infrastructure improvements to become a representative tourist destination. According to a report from Radar Pos, some improvements have been made, such as the installation of joglo-style barriers, but overall, the area's management remains suboptimal (Yusup, 2023). Based on the 2023 Dayu Village monograph data (Figure 1), from a socioeconomic perspective, the majority of Dayu residents work as farmers, farm laborers, and craftsmen, numbering 600, 500, and 459 respectively. Additionally, approximately 1,500 people are unemployed or without work. The community's education level is relatively low, with most having only completed elementary or junior high school, and only about 225 holding a university degree. This situation indicates the need to enhance skills and empower the community to open alternative business opportunities that can improve their economic status.

MONOGRAFI DESA	
BULAN :	
TAHUN : 2023 / 2024	
<b>Nama Desa</b> Dayu <b>Desa Kode Wilayah</b> 3313130.011 <b>Desa Kode Pos</b> 57773 <b>Kecamatan</b> Gondangrejo <b>Kabupaten</b> Karanganyar <b>Provinsi</b> Jawa Tengah	
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**Figure 1.** Monograph of Dayu Village

Based on observations and interviews with local residents, several issues were identified in Dayu Village, including limited spatial planning and infrastructure at Cemoro Pitu Peak, which hinder the development of its tourism potential, and a lack of skills among the local

community to economically manage and utilize local potential. Furthermore, integration between natural tourism potential and local economic empowerment has not yet been realized. The community requires assistance in activities that could potentially increase their income beyond their primary occupations. This need arises from the low education level and human resource capacity of Dayu Village residents to improve their economic conditions.

One solution that can be implemented is training in crafting using waste materials from PET strapping bands. Plastic waste, especially polyethylene terephthalate (PET), poses a significant environmental challenge due to its resistance to natural degradation. Research indicates that PET waste can take approximately 300 to 450 years to decompose naturally, and during this degradation process, it can release microplastics harmful to ecosystems (Utomo & Arfiana, 2023).

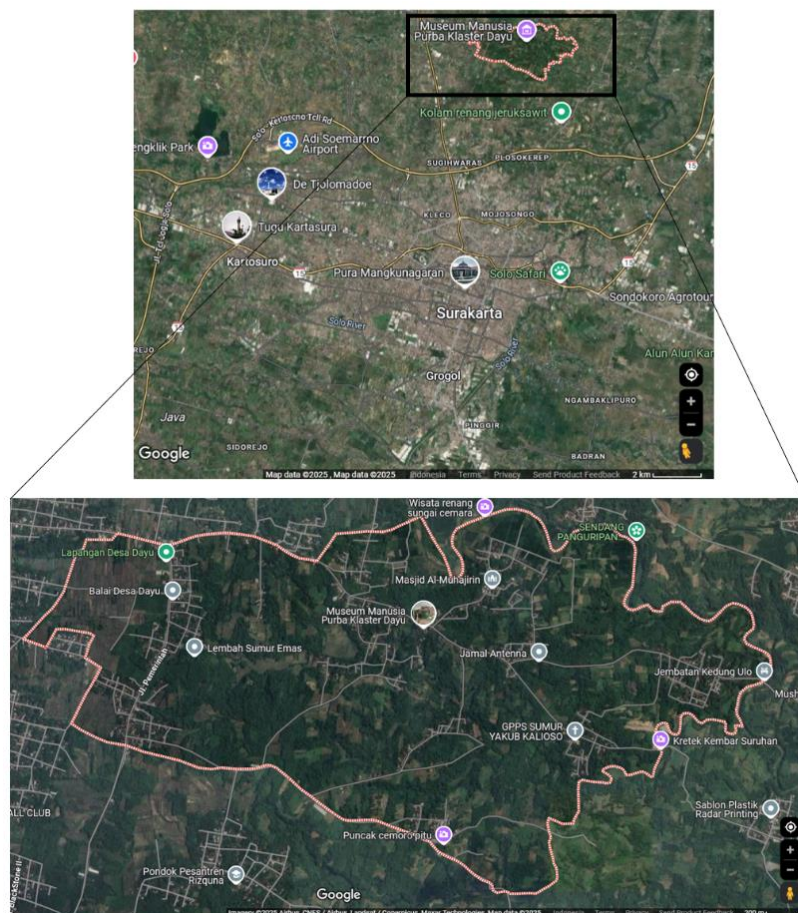
PET strapping bands, commonly used in the packaging industry, often become waste after single use. However, this waste has the potential to be recycled into various economically valuable handicraft products, such as bags, plant pots, baskets, and trash bins. This recycling process not only reduces the volume of plastic waste but also opens new business opportunities for communities, especially in rural areas like Dayu Village (Cyklop Indonesia, 2024; Kencana Online, 2024). The majority of Dayu's population works as farmers, farm laborers, and craftsmen, with relatively low education levels. This condition highlights the need for community empowerment programs that can enhance their skills and income. Training in crafting from PET strapping waste can be an effective solution, as it not only utilizes waste but also provides added economic value to the community.

Moreover, processing PET strapping waste into handicraft products aligns with the principles of community-based ecotourism. By developing unique handicraft products from plastic waste, Dayu Village can enrich local tourist attractions, such as Cemoro Pitu Peak, which has great potential as a natural tourism destination. This can attract more tourists and improve the village's overall economy. Based on these regional issues and partnership considerations, the objective of this community service activity is to provide "Assistance in Processing PET Strapping Waste into Economically Valuable Handicrafts for the Community of Dayu Village, Gondangrejo Subdistrict, Karanganyar Regency."

## 2. Methods of Implementation

### 2.1. Overview of Regional Conditions and Partners

Dayu Village is located in Gondangrejo Subdistrict, Karanganyar Regency, Central Java Province. The village falls within the postal code area 57773. Covering an area of 569.2029 hectares, Dayu Village is bordered directly by Krendowahono Village to the north, Rejosari Village to the south, Tuban and Bulurejo Villages to the west, and Wonorejo Village to the east. The distance from Dayu Village to the subdistrict government center is 3.5 km, to the regency center 10 km, to the nearest city 35 km, and to the provincial capital 110 km. This strategic location provides Dayu Village with relatively close access to various government centers and major cities (Figure 2).



**Figure 2.** Dayu Village, Gondangrejo, Karanganyar, Central Java

Based on the 2023 Dayu Village monograph data, the population of Dayu Village reached 3,689 individuals from 1,235 households, consisting of 1,866 males and 1,823 females. The

age distribution shows that the majority of the population is of productive age, with 2,623 individuals aged 15–56 years, while 713 are children (aged 0–15 years), and 353 are elderly (over 56 years). Most residents work as farmers (600 people) and farm laborers (500 people). Other occupations include craftsmen (459 people), service workers (560 people), and entrepreneurs/traders (90 people). However, approximately 1,500 people are unemployed or do not have fixed jobs. This number indicates an urgent need to create alternative economic opportunities and skills training for the community.

The education level of Dayu Village residents is relatively low. Of the total population, most have only completed elementary/madrasah ibtidaiyah (310 people) and junior high school (90 people). The number of high school/vocational school graduates is 225, and only 35 individuals have completed undergraduate education. Additionally, 322 people are recorded as not attending school or not completing elementary education. These data emphasize the importance of capacity-building and skills development programs, especially for the productive age group and those without higher education. The community's welfare level also shows that 417 households fall into the poor category, both those receiving and not receiving BPJS assistance (Dayu Village, 2023).

## **2.2. Implementation Stages of the Activity**

The community service activity entitled "Assistance in Processing PET Strapping Waste into Economically Valuable Handicrafts for the Community of Dayu Village, Gondangrejo Subdistrict, Karanganyar" was carried out through three main stages: pre-activity, core activity, and post-activity. The preparation stage began with initial coordination between the implementation team and representatives of the Dayu Village Government on November 1, 2023. This coordination aimed to communicate the activity plan, establish implementation mechanisms, and map the potentials and needs of the community relevant to the service theme. During this stage, the activity location and primary target group were also determined, namely residents around Cemoro Pitu Peak, most of whom work as farmers, farm laborers, and craftsmen.



Subsequently, on November 10, 2023, a follow-up meeting was held involving the service team, village officials, and residents interested in developing handicraft skills from PET strapping waste. This meeting was used to explain the technical training agenda, socialize the benefits of the activity, and foster active community participation. The event also served as an initial forum to build collaborative spirit and awareness of the importance of waste processing skills into economically valuable products.

The main activity was conducted on November 12, 2023, consisting of direct training on processing PET strapping waste into various handicraft forms such as flower pots, trash bins, bags, and multifunctional containers. The training was facilitated by practitioners and mentors from the service team experienced in community empowerment and waste processing. Participants were provided with knowledge about basic PET strap processing techniques, from sorting, cleaning, to product formation. The activity was delivered using a participatory approach that encouraged participants to practice the techniques learned, discuss product design ideas, and understand the potential market value of the crafts produced. This approach also instilled environmental awareness and circular economy values through the utilization of previously valueless non-organic waste. The final stage of the activity involved evaluation and follow-up through discussions. Evaluation is important part of continuous improvement in community engagement (Hadibasyir, Saifuddin, & Furoida, 2021; Triyono et al., 2024). Additionally, community aspirations were gathered to identify further support needs, such as advanced training.

### **3. Results and Discussion**

The community service activity entitled “Assistance in Processing PET Strapping Waste into Economically Valuable Handicrafts for the Community of Dayu Village, Gondangrejo Subdistrict, Karanganyar,” organized by lecturers from the Faculty of Geography at Muhammadiyah University of Surakarta, was successfully conducted and received positive responses from the local community. The activity took place at the pavilion of Cemoro Pitu Peak, which also serves as an attractive public space in Dayu Village. During the pre-activity phase, initial coordination on November 1, 2023, with representatives of the Dayu Village

Government proceeded smoothly. The residents demonstrated a cooperative and open attitude during discussions, expressing enthusiasm and readiness to support activities aimed at enhancing skills and providing alternative income sources beyond their primary occupations, such as farming, farm labor, and other daily jobs.

Subsequently, on November 10, 2023, a follow-up coordination meeting was held involving the implementation team, village representatives, and prospective participants from Dayu Village. The forum was conducted in a formal yet warm and familial atmosphere, concluding with a communal dinner (Figure 3). During this forum, the residents agreed that the training would be held on Sunday, November 12, 2023, to avoid disrupting their main work activities and to allow greater participation. This agreement reflected the high level of active participation and collaborative spirit among the residents toward the offered program.



**Figure 3.** Coordination meeting of the community service implementation team, community representatives, and Dayu Village residents

The core activity was carried out on November 12, 2023, focusing on assisting the processing of PET strapping waste into economically valuable handicrafts. This activity was a collaboration between lecturers from the Faculty of Geography at UMS and a craftsman skilled in transforming PET strapping waste into marketable products. The training was

attended by 19 participants from Dayu Village. Figures 4a and 4b show the basic materials used to create trash bin crafts from PET strapping waste.



**Figure 4.** (a) PET strapping waste and (b) metal frame for making trash bin crafts from PET strapping.

Initially, the training was planned to cover various handicraft products; however, considering participant dynamics and the pace of material comprehension, the training focused on making trash bin crafts from PET strapping waste. This product was chosen because trash bins are relatively easy to make and have a sufficiently high market demand, making them suitable as an initial product for residents new to this skill. Figures 5 and 6 illustrate the assistance process in making trash bin crafts from PET strapping waste.



**Figure 5.** Assistance process in making trash bin crafts from PET strapping.





**Figure 6.** Collaboration between community representatives and residents during the making of trash bin crafts from PET strapping.

Figure 7 presents examples of handicraft products resulting from the assistance activity. The processing PET strapping waste into trash bins. The woven PET strapping products are favored due to their durability and design flexibility. Some craftsmen reported that woven PET shopping baskets and trash bins maintain stable sales in local markets and e-commerce platforms (Nurul, 2023). According to information from PET strapping waste craftsmen, the material price is approximately IDR 10,000 per kilogram. The rental cost for molds and tools is IDR 180,000, which can produce between 22 and 25 trash bin crafts. Market data indicate that the retail price per trash bin ranges from IDR 50,000 to IDR 100,000.



**Figure 7.** Example of handicraft products from the community service activity processing PET strapping waste into trash bins.

The activity evaluation was conducted through open discussions and direct feedback from participants. The evaluation results showed a high level of satisfaction among residents regarding the implementation of this activity. Residents felt helped by the new skills acquired and appreciated the friendly and practical assistance methods. From aspiration gathering, residents expressed hopes that such activities could be continued regularly. They wish to improve their skills in processing PET strapping waste and learn to make other types of handicrafts beyond trash bins. These aspirations indicate the potential sustainability of the activity and opportunities for community economic empowerment through environmentally friendly waste utilization.

#### **4. Conclusion**

The program "Assistance In Processing Polyethylene Terephthalate (PET) Strapping Waste Into Economically Valuable Handicrafts For The Community Of Dayu Village, Gondangrejo Subdistrict, Karanganyar Regency " successfully enhanced the technical capacity and economic potential of the residents. The pre-activity coordination on November 1 and 10, 2023, fostered commitment from village officials and the community to participate. The core training on November 12, 2023, attended by 19 participants, focused on the production of trash bins from PET strapping waste. The participatory method with hands-on practice improved participants' understanding while fostering environmental awareness. Post-activity evaluation indicated a high level of satisfaction and aspirations for further training and diversification of handicraft products. This success underscores the importance of empowerment based on local resources and circular economy principles, as well as opening opportunities for program sustainability as a model for economic development in Dayu Village.

#### **5. Acknowledgements**

We express our sincere gratitude to the residents of Dayu Village, village officials, instructors, and participants for their enthusiasm, cooperation, and dedication in the outstanding PET handicraft production activities.

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