

## Innovation of Batang Serangan River Wood Waste as a Superior Product for Sei Serdang Village in the Tangkahan Ecotourism Area

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### Abstract

Sei Serdang Village is one of the tourist villages in the Tangkahan Ecotourism area. This village area is part of the Gunung Leuser National Park region, which is a key destination for tourists visiting Tangkahan. The Batang Serangan River has become a problem for the residents of Sei Serdang village, as the riverbanks are filled with broken and damaged wood, leading to potential flash floods. The aim of this activity is to train local partners, who are craft and furniture makers in Sei Serdang village, to manage the wood waste from the Batang Serangan River. Proper wood waste management can reduce production costs, clean up the Batang Serangan River from wood waste, and contribute to the community's welfare. This activity uses a participatory approach combining lectures, discussions, training, and activity monitoring. The stages of the activity include observation, socialization, wood waste design training, preservation training, production and finishing training, and finally, evaluation. The team conducted pre and post-tests to evaluate and understand perceptions of wood waste production knowledge. The results show a 40% increase in craftsmen's understanding of wood waste processing, a 10% increase in business potential understanding, a 12% increase in knowledge of supporting equipment use, and a 15% increase in awareness of maintaining the Batang Serangan River.

**Keywords:** Innovation, Creativity, Wood Waste Production, Environmental Preservation.

### 1. Introduction

Sei Serdang Village is a tourist village in the Tangkahan Ecotourism area, which is part of the Gunung Leuser National Park, a major attraction for tourists visiting Tangkahan. According to BPS 2022 data ([BPS] Badan Pusat Statistik, 2023), in 2022, there were 3,681 tourists visiting Tangkahan, a significant increase from 494 visitors in 2021. Sei Serdang Village is traversed by the Batang Serangan River, a major river flowing from the Leuser Forest.

During the rainy season, the Batang Serangan River becomes problematic for the residents of Sei Serdang, as the riverbanks are filled with broken and damaged wood, leading to potential

flash floods ([gunungleuser.or.id](http://gunungleuser.or.id), 2021). According to the Tangkahan Tourism Agency, during the rainy season, there are dozens of tons of wood waste scattered along the Batang Serangan Riverbanks. The issue is that the Sei Serdang Village government is trying to encourage the community to maximize the use of this wood waste, but most of the broken wood is only used as firewood by the local community without processing it into high-value products. However, this wood waste consists of high-quality types like damar, meranti, and raja wood. Proper wood waste processing not only helps maintain river cleanliness but also adds to the community's income (Tahang et al., 2018) through river waste-based crafts.



**Figure 1. Batang Serangan River Waste**

Currently, the partners face the problem of lacking knowledge on processing wood waste into economic products such as souvenirs and crafts. The partners perceive that broken and hollow wood is difficult to process. Due to the lack of proper knowledge on wood waste management, production costs are rising as the price of wood increases. However, with proper wood waste management, it could become a unique souvenir icon for Tangkahan Ecotourism, a potential source of income for the community while also preserving the river environment.

The partners for this community service activity are two business groups under the Sei Serdang Village Government: the Jurung Clift group, led by Kurnia Sitepu, comprising twenty furniture craftsmen, and the Tualang Handycraft group, led by Medianta Ginting, which includes twenty souvenir craftsmen in the Sei Serdang village area. The partners in this activity are groups that use wood as a production material. If the partners have skills in processing wood waste, it can reduce production costs and improve the welfare of the handicraft and furniture craftsmen in Tangkahan.

### **Partner Problems**

The partner groups are craft and furniture makers. Currently, they produce souvenirs and furniture using wood but do not fully utilize wood waste, due to the perception that wood waste is of poor quality, such as damaged or defective wood. However, there is significant potential to be gained by properly and creatively utilizing wood waste (Eskak & Sumarno, 2016; Jumawan & Yusuf Ali, 2020; Tahang et al., 2018) By utilizing wood waste, production costs can be reduced, river cleanliness can be maintained, crafts and furniture craftsmen's welfare can be improved, poverty in the Tangkahan ecotourism area can be reduced, and partner competencies in business innovation can be increased.

### **1.1 Priority Problems**

The priority problems for the target partners and government in this activity are in the areas of environment, economy, and human resources in the tourism sector.

- (1) Partners lack awareness of maintaining the Batang Serangan River environment and the potential of utilizing wood waste.
- (2) Partners lack experience in wood waste management innovation, resulting in a lack of knowledge about functional and artistic design. Consequently, they do not have the expertise to create diverse designs for wood waste crafts.
- (3) Partners have limited knowledge about wood treatment for production, such as proper wood sorting and preservation techniques. They lack knowledge in handling defective wood characteristics like holes and irregular shapes, leading to increased production costs due to reliance on purchased wood.
- (4) Partners have Limited knowledge about producing crafts and furniture from wood waste

### **1.2 Problem Solutions**

Based on the problems identified in Sei Serdang Village, Tangkahan, the proposed solutions for addressing the partner issues are as follows:

- (1) Educate partners about the potential of using Batang Serangan River wood waste for high-quality crafts and furniture. This aims to increase awareness of business opportunities with wood waste while maintaining river cleanliness
- (2) Design Training for Crafts and Furniture. The goal is for partners to be able to design and produce crafts and furniture from wood waste in a more attractive way.
- (3) Teach partners about wood treatment, including types and methods of preserving wood, to ensure proper preservation based on wood type.

Train partners in furniture and souvenir production from wood waste, including finishing techniques using duco.

## **2. Method**

### **2.1 Time and Place**

The community service activities will be conducted from March to June 2024. The location is Sei Serdang Village, Langkat Regency, one of the tourist villages in the Tangkahan ecotourism area.

### **2.2 Implementation Method**

The implementation method uses a participatory approach combining lectures, discussions, training, and monitoring. This community service activity applies wood waste innovation for producing souvenirs and furniture to two community groups in the Tangkahan tourist village. The goal is to reduce the quantity of Batang Serangan River wood waste and improve the welfare of the partners in the Tangkahan tourist village. The activity stages are as follows:

- (1) Permits

Coordinate with the Village Government of Namo Sialang, Sei Serdang, and Sei Musam, which are the main tourist village centers in the Tangkahan Ecotourism area. Permits are

also aimed at ensuring full support from the village government for smooth activity execution.

(2) **Socialization of Business Potential for Wood Waste Utilization**

This involves educating partners about the potential of Batang Serangan River wood waste for high-quality crafts and furniture. The team will present a feasibility study of wood waste processing and provide examples of various crafts that can be produced.

(3) **Training on Proper Wood Treatment**

The team will present wood preservation techniques and train partners in sorting wood suitable for crafts and furniture.

(4) **Craft Design Training**

The team will provide examples of various wood waste designs (e.g., mirror frames, tissue boxes, kitchen utensils, accessories, educational toys) and partners will practice sketching designs for wood waste-based souvenirs.

(5) **Furniture Design Training**

The team will present how to design furniture from wood waste and partners will practice designing furniture/products with various wood waste types (e.g., bookshelves, patio chairs, umbrella stands).

(6) **Production and Finishing Training**

The team will demonstrate furniture and craft production and practice finishing techniques to enhance product quality visually. Partners will engage in hands-on practice during the presentation.

(7) **Assistance and Evaluation**

The team will evaluate and monitor the results of the activities with the village government, including the production of furniture and souvenirs from wood waste and the production capacity achieved by the partners.

(8) **Program Sustainability**

The team will follow up on the results of the assistance and evaluation by preparing to strengthen the management of wood waste processing from the Batang Serangan River.

## **2.3 Partner Participation**

The community service activity involves partner participation in the following ways:

- (1) Partners agree to actively participate in all program activities until completion.
- (2) Partners collaborate in providing training locations.
- (3) Partners actively apply the training activities to their business and document these activities well.
- (4) Partners work together to provide feedback to resolve issues encountered in applying the training activities.

## **3. Results and Discussion**

The socialization and training event was attended by the Jurung Clift group, led by Kurnia Sitepu and consisting of twenty furniture craftsmen, and the Tualang Handycraft group, led by Medianta Ginting and consisting of twenty members, making a total of forty participants. Additionally, the training was attended by the Head of Sei Serdang Village, Mr. Ngahriken

Kacaribu, who is the mentor for the village's craft groups. The results of this community service activity are as follows:

(1) Socialization of Wood Waste Business Potential

The socialization activity was the beginning of the program where the team provided education on the potential of utilizing wood waste from the Batang Serangan River. This activity was held at the Sei Serdang Village art gallery with the aim of raising awareness about the utilization of wood waste. The team provided counseling to motivate partners to manage wood waste found along the Batang Serangan Riverbanks. Wood waste is one of the organic wastes that is difficult to process (Fajrie et al., 2022), Most of the Sei Serdang Village community often uses wood waste as fuel, so there is a need for awareness to reprocess it to maintain the cleanliness of the Batang Serangan River. Additionally, the village area has many furniture and craft artisans who can maximize the processing of river wood waste. During this session, the team provided insights into the business potential of wood waste that partners could pursue. The socialization also covered simple business planning for wood waste, such as calculating production costs where the use of waste plays a significant role in reducing production costs, and marketing activities by maximizing social media. The socialization took place on March 5, 2024.



**Figure 2. Socialization of Wood Waste Utilization Potential**

The socialization ended with a Q&A session where participants had the opportunity to ask questions related to the material presented. Participants' questions mostly concerned requests for assistance in successfully selling wood waste products. The team took these requests into account for future training activities.

(2) Training on Designing Handicrafts and Furniture

This activity involved training on designing handicrafts and furniture based on the available wood waste. The team motivated partners to find creative ideas and translate these ideas into simple sketches. During this activity, the team provided examples of simple designs as follows:



**Figure 3. Furniture and Handicraft Designs from Wood Waste**

Simple sketches can create aesthetic and unique works to attract buyers. Well-designed products tend to have a higher market value, thereby increasing the economic value of the crafts. Learning design helps partners generate new and innovative ideas in wood waste crafting.

(3) Training on Wood Selection and Preservation

The next activity involved guiding partners in selecting and preserving wood waste naturally. To date, partners have only been drying wood as a natural preservation technique. Wood preservation is essential to prevent wood from mold and termites. Additionally, wood preservation can extend the wood's usability and increase its market value. The wood waste in Tangkahan consists of damar, meranti, and raja wood, which are of good quality. The preservation techniques introduced by the team include using coatings such as tar, oil, and other relatively cheap and easily available materials in Sei Serdang Village. This activity was conducted directly at the art workshop around the Sei Serdang River, which is where the wood waste is accumulated.



**Figure 4. Wood Selection and Preservation Training.**

It is hoped that wood preservation activities will enhance partners' knowledge in utilizing various types of wood waste, thereby improving sustainability and economic efficiency in recycling wood waste from the Batang Serangan River..

(4) Training on Production of Souvenirs and Furniture from Wood Waste

Based on the team's observations, there were several tools that the partners did not have and needed to be provided by the team to support the production of handicrafts and furniture. The required tools for this community service program include: a 8" table saw, hand planer, hand sander, polyurethane wood glue, 120cm bar clamp, cordless drill, and cordless driver.

The wood waste production process includes several stages as follows, with references from various sources (Dewi & Hidayat, 2016; Suprijono et al., 2020; Waisnawa et al., 2017):

- (a) Sorting wood waste, The types of wood found in the Batang Serangan River include damar, meranti, and raja wood, with an average thickness of 1 to 3 cm and varying lengths. Most of the waste is irregular in length, width, and shape. In this activity, the team sorted wood with a maximum length of 50 cm for easier simulation.
- (b) Pattern formation according to the desired design, The pattern drawing can be done using a computer and printed or manually drawn. In this training, patterns were drawn manually on HVS paper, as the partners did not have a computer.
- (c) Wood shaping using an 8" table saw to standardize dimensions, a small 8" saw blade was used due to the generally small dimensions of the wood waste, resulting in a smoother cut.
- (d) Gluing, Wood waste is glued using polyurethane wood glue. During the gluing process, the wood pieces must be arranged according to the design and grain direction before gluing. The uniform pieces are glued on the outer sides and then assembled according to the initial design and grain direction.
- (e) For furniture using relatively large wood sizes, bar clamps of 120 cm are used to hold the wood in place, ensuring proper gluing, which takes 10 to 20 minutes.
- (f) Surface leveling, also known as planing or scraping the wood
- (g) Finishing, where the wood waste is sanded with a hand sander for a smoother and neater final result.
- (h) The planed wood is then polished with wood oil, varnish, and other finishing materials.



**Figure 5. Training on Crafting Souvenirs and Furniture from Wood Waste**

#### (5) Monitoring and Evaluation

The team conducted pre- and post-tests to gauge perceptions regarding wood waste production understanding. The results showed a 40% increase in the perception of wood waste processing understanding, a 10% increase in business potential understanding, a 12% increase in knowledge of supporting equipment usage, and a 15% increase in awareness of maintaining the Batang Serangan River. Thus, there was an increase in knowledge and skills in managing wood waste after participating in the training.

The team also provided ongoing support to ensure the continuous and increasingly creative production of wood waste, with assistance extending through the end of 2024.

#### 4. Conclusions and Recommendations

Wood waste has been a problem along the Batang Serangan River because it is only minimally used by the community, often as firewood or left scattered by the riverbank, potentially causing flash floods. Souvenir and furniture craftsmen in Sei Serdang Village have not maximized the use of wood waste. By using wood waste creatively, production costs can be reduced by decreasing dependence on purchased raw wood.

This community service activity received a positive response from the Sei Serdang Village community. For future activities, it is recommended to focus on business management and marketing, as well as improving the layout of the art gallery in Sei Serdang Village, which is where artisans showcase their work to tourists visiting Tangkahan and the Batang Serangan River.

#### References

- 1) [BPS] Badan Pusat Statistik. (2023). Kecamatan Batang Serangan Dalam Angka 2023. In *Badan Pusat Statistik* (Vol. 5, Issue 1).  
<https://revistas.ufrj.br/index.php/rce/article/download/1659/1508>
- 2) Dewi, D. A. N., & Hidayat, M. J. (2016). Pemanfaatan Limbah Kayu Untuk Kemasan Cenderamata Khas Kalimantan Timur. *Jurnal Kreatif*, 0, 1–23.
- 3) Eskak, E., & Sumarno, S. (2016). Peningkatan Nilai Tambah Pada Cacat Batang Kayu Dengan Kreasi Seni. *Dinamika Kerajinan Dan Batik: Majalah Ilmiah*, 33(2), 133. <https://doi.org/10.22322/dkb.v33i2.1649>
- 4) Fajrie, M., Adi Pradana, B., Rowi, M. Y., Ihsan, L. N. H., Iskandar, Z. A., & Faizin, N. (2022). Pemanfaatan Limbah Kayu Menjadi Kerajinan Fungsional Dan Bernilai Estetik Di Desa Bugel. *Journal of Dedicators Community*, 6(3), 321–326. <https://doi.org/10.34001/jdc.v6i3.2500>
- 5) [gunungleuser.or.id](https://gunungleuser.or.id). (2021). *Tangkahan*. <https://Gunungleuser.or.Id/Tangkahan/>.
- 6) Jumawan, F., & Yusuf Ali, M. (2020). Usaha Kreatif Pengolahan Limbah Kayu di Kabupaten Soppeng. *Jurnal Pendidikan Dan Pengabdian Masyarakat*, 3(3), 149–153. <https://jurnalfkip.unram.ac.id/index.php/JPPM/article/view/1968>
- 7) Suprijono, H., Wijaya, D. K., & . K. (2020). Edukasi dan Pelatihan Pembuatan Papan Kayu Laminasi dari Limbah Kayu Jati di Kelompok Industri Meubel Rumahan Desa Mangunsari. *Abdimasku : Jurnal Pengabdian Masyarakat*, 3(2), 25. <https://doi.org/10.33633/ja.v3i2.91>
- 8) Tahang, Fapari, N., & Tamrin, A. F. (2018). Program Kemitraan Masyarakat Ekonomi



Kreatif Usaha Mebel di Kecamatan Ujungloe, Kabupaten Bulukumba. *Jurnal Abdi Moestopo*, 1, 2018–2021.

- 9) Waisnawa, I. G. N. S., Sudana, I. M., & Swaputra, I. B. (2017). Kerajinan Berbahan Limbah Kayu (Driftwood) Dan Evaluasi Tata Letak Fasilitas Kerja. *Bhakti Persada Jurnal Aplikasi IPTEKS*, 2(1), 21.