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Transforming Waste into Value: Developing Shrimp Powder Broth in Sungsang Village

Mengubah Limbah Menjadi Bernilai: Pengembangan Kaldu Bubuk Udang di Desa Sungsang

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Abstract

The Sungsang area in Banyuasin Regency, South Sumatra, has a nutrient-rich estuary ecosystem that supports aquatic biota such as fish, shrimp, and crabs. Residents mostly work as fishermen and process fishery products into value-added products, such as shrimp paste and crackers. However, shrimp shell waste is often neglected despite its high economic potential. Community service activities in Sungsang IV Village aim to increase environmental awareness and encourage innovation in the utilization of shrimp shell waste. The method of this community service activity is through socialization and training in producing powdered broth from shrimp shell waste. Through training, the community was given an understanding of sustainable waste management and the skills to process shrimp shell waste into economical powdered broth. As many as 80% of participants stated that they understood the material very well, and the program succeeded in reducing environmental pollution while increasing local income. With high enthusiasm, the program is relevant to the community's needs, providing positive economic, social, and ecological impacts.

Keywords*: Shrimp Powder Broth, Shrimp Shell Waste, Processed Products*

Abstrak

Kawasan Sungsang di Kabupaten Banyuasin, Sumatera Selatan, memiliki ekosistem muara yang kaya akan unsur hara dan mendukung kehidupan biota air seperti ikan, udang, dan kepiting. Sebagian besar penduduknya berprofesi sebagai nelayan dan mengolah hasil perikanan menjadi produk bernilai tambah, seperti terasi dan kerupuk. Namun, limbah cangkang udang sering kali terabaikan meskipun memiliki potensi ekonomi yang tinggi. Kegiatan pengabdian masyarakat di Desa Sungsang IV bertujuan untuk meningkatkan kepedulian terhadap lingkungan dan mendorong inovasi pemanfaatan limbah cangkang udang. Metode kegiatan pengabdian masyarakat ini adalah melalui sosialisasi dan pelatihan pembuatan kaldu bubuk dari limbah cangkang udang. Melalui pelatihan, masyarakat diberikan pemahaman mengenai pengelolaan sampah yang berkelanjutan dan keterampilan mengolah limbah cangkang udang menjadi kaldu bubuk yang bernilai ekonomis. Sebanyak 80% peserta menyatakan bahwa mereka memahami materi dengan sangat baik, dan program ini berhasil mengurangi pencemaran lingkungan sekaligus meningkatkan pendapatan masyarakat. Dengan antusiasme yang tinggi, program ini relevan dengan kebutuhan masyarakat dan memberikan dampak positif secara ekonomi, sosial, dan ekologi.

Kata kunci*: Kaldu Bubuk Udang, Limbah Kulit Udang, Produk Olahan*

INTRODUCTION

Indonesia is strategically located between two continents, namely the Asian and Australian continents, and two major oceans, the Pacific Ocean and the Indian Ocean. Additionally, Indonesia comprises more than 17,000 islands and possesses a coastline extending 95,181 km, making it abundant in fisheries resources. The fisheries sector has consistently demonstrated its significance for Indonesia's economic growth, contributing 2.58% to the national GDP in 2022, with a sectoral GDP growth rate of 2.79% in the same year. The diverse marine biota within Indonesian waters plays a crucial role in sustaining livelihoods, particularly for communities engaged in the fishing industry (BPS, 2023).

One of the regions in South Sumatra Province known for its fishery products is the Sungsang Region. Situated at the mouth of the Musi River, Sungsang serves as a crucial link between Palembang and the Bangka Strait. Administratively, Sungsang falls within Banyuasin II District, Banyuasin Regency, South Sumatra Province. The region consists of five villages: Marga Sungsang, Sungsang 1, Sungsang 2, Sungsang 3, and Sungsang 4, with an estimated population of approximately 20,000 inhabitants. Sungsang serves as the administrative center of Banyuasin II District, which spans a total area of 3,632 km^2 and comprises 17 villages (BPS South Sumatra Province, 2023).

The Sungsang area is characterized by an estuarine ecosystem rich in nutrients, which plays a vital role in sustaining aquatic biota, including fish, shrimp, and crabs. For instance, estuaries serve as spawning, nursery, and feeding grounds for various fish species. Given these ecological functions, estuaries are recognized for their high biodiversity (Fauziah et al., 2019). The majority of Sungsang's residents rely on fishing as their primary livelihood. The distinctive fishing village atmosphere is immediately apparent upon entering the region, where settlements are built on water. The daily activities of the community highlight the area's unique cultural and economic characteristics, demonstrating its potential for further development.

Among the key fishery commodities in the Sungsang waters, shrimp stands out as a primary product for coastal communities in Banyuasin Regency. Numerous shrimp farms are established in the region, producing high-quality shrimp that contribute to the local economy. In addition to direct shrimp fishing, the local community has developed various processed shrimp products, including salted fish, shrimp pempek, shrimp paste, fish/shrimp kemplang, shrimp crackers, crushed shrimp, and other derivative products. The development of these processed goods adds value to the shrimp fishery sector and provides alternative sources of income for coastal residents.

Despite the high productivity of shrimp fisheries, shrimp shell waste is often regarded as a byproduct with no economic value. However, this waste has substantial potential for transformation into value-added products, such as shrimp powder stock. Shrimp shells contain essential nutrients, including 84 kcal of energy, 18 grams of protein, selenium (48% of the Recommended Daily Intake [RDI]), vitamin B12 (21% of the RDI), iron (15% of the RDI), phosphorus (12%), niacin (11%), zinc (9%), and magnesium (7%) of the average daily requirement (Pratiwi et al., 2022; Riadi et al., 2021; Wowor et al., 2015). Converting shrimp shell waste into shrimp powder stock represents an innovative

approach that enhances the value of fisheries products while mitigating the environmental impact of organic waste accumulation. Effective utilization of shrimp shell waste in Sungsang Village can serve as a model for other regions, promoting sustainable and environmentally responsible fisheries resource management.

The development of shrimp powder stock from shrimp shell waste in Sungsang Village not only enhances the economic value of fishery products but also contributes positively to waste management and environmental sustainability. Therefore, concrete efforts are required to improve waste management and foster innovation in product development to support sustainable economic growth in the region.

METHODS

This community service activity was conducted in Sungsang IV Village, Banyuasin II District, Banyuasin Regency. This program was implemented from September 2024. The method of implementation encompassed educational outreach and training in the production of powdered stock derived from shrimp shell waste. The primary beneficiaries of this initiative were the residents of Sungsang IV Village.

The community service methodology comprised several stages. Initially, a theoretical session was conducted to disseminate knowledge regarding the nutritional value and processing techniques of shrimp shell powder stock. This session covered the potential benefits of shrimp shell waste, its nutritional composition, and its applicability as a food ingredient. Subsequently, practical training and mentoring sessions were conducted, wherein participants were systematically guided through the process of converting shrimp shell waste into powdered stock. These sessions involved demonstrations, hands-on practice, and problem-solving discussions to ensure the participants acquired the requisite skills. Finally, an evaluation phase was undertaken to assess the effectiveness of the training program. This evaluation included collecting participant feedback, monitoring their ability to apply the acquired knowledge, and identifying areas requiring further improvement.

RESULTS & DISCUSSION

A community service activity was conducted over three days, from September 2 to September 4, 2024. The program involved 25 participants, including village heads, fishermen, housewives, and small and medium-sized enterprises (SMEs) from Sungsang 4 Village, Banyuasin II District, Banyuasin Regency, South Sumatra Province. The enthusiasm of the participants was evident throughout the event, as demonstrated by their active participation, positive responses, and constructive feedback during the training sessions.

The event commenced with opening remarks by the Head of *Pemberdayaan Kesejahteraan Keluarga (PKK)* of Sungsang 4 Village, followed by a speech from the Head of the Community Service Team and a prayer recitation. The introductory session featured a lecture delivered by a Sriwijaya University faculty member specializing in

fisheries waste management and value-added product development. This two-hour session provided fundamental insights into the significance of sustainable shrimp shell waste management.

On the first day, participants were introduced to the potential of shrimp shell waste, its nutritional content, and the economic benefits derived from transforming waste into shrimp powder broth. An interactive discussion and a question-and-answer session followed the presentation. The second day was dedicated to hands-on technical training on shrimp powder stock production, covering the preparation of raw materials, waste processing techniques, and product packaging. The participants displayed great enthusiasm during the practical session, which was supervised by a team of experts.

On the final day, the program concluded with an evaluation of the practical training outcomes, discussions on improving the production process, and the completion of a questionnaire to assess the program's effectiveness and gather feedback for future development. The development of shrimp powder stock from shrimp shell waste in Sungsang Village not only enhances the economic value of fishery products but also contributes positively to waste management and environmental sustainability. Therefore, concrete efforts are required to improve waste management and foster innovation in product development to support sustainable economic growth in the region.

Figure 1. Participants in Community Service Activities

Participants' Responses

The participants responded positively to the training. They expressed that the program provided them with valuable insights into repurposing shrimp shell waste—previously regarded as worthless—into an economically viable product, namely shrimp powder stock. The content delivered was deemed highly relevant to the needs of the Sungsang 4 Village community, where many residents are engaged in small-scale fisheries-based enterprises.

Through the practical sessions, participants not only acquired theoretical knowledge but also developed hands-on skills in processing shrimp shell waste into innovative products. This hands-on experience enabled them to adopt new strategies for enhancing the value of fishery products. Additionally, participant interactions fostered knowledge-sharing and strengthened collaborative networks for business development.

Equipped with these newfound skills and knowledge, participants expressed confidence in their ability to enhance the competitiveness of Sungsang 4 Village's fishery products in the market while making a tangible contribution to the local economy and community welfare.

Figure 2. Giving Chopper to Participants to Practice Making Shrimp Powdered Broth

Figure 3. Practice of Making Powdered Broth from Shrimp Shell Waste

Feedback plays a crucial role in community service activities as it evaluates the extent of participants' understanding and knowledge regarding shrimp shell waste processing into value-added products, particularly shrimp powder broth. Additionally, feedback serves as a measure of the program's success, assessing both the effectiveness of material delivery and the implementation of hands-on training by participants.

During the feedback session, each participant was encouraged to share their impressions, comments, as well as constructive criticism and suggestions regarding the training. This approach aimed to foster confidence in expressing opinions openly and to provide valuable input for the program organizers. The majority of participants responded positively, highlighting that the training materials were highly relevant and beneficial.

Table 1. Evaluation of the Importance of Community Service Activities

The Importance of Community Service Activities	Frequency	Percentage (%)
Very Important	24	96.00
Important	1	4.00
Neutral	0	0.00
Not Important	0	0.00
Very Unimportant	0	0.00
Total	25	100.00

Source: Field Data, 2024

According to the questionnaire results, 96% of participants considered the community service activity very important, while 4% deemed it important. None of the participants indicated that the activity was irrelevant, confirming the necessity of this training for the residents of Sungsang 4 Village.

Table 2. Level of Understanding and Knowledge of Participants Regarding Waste Management Training

Participant's Level of Understanding	Frequency	Percentage (%)
Very Understand	20	80.00
Understand	5	20.00
Neutral	0	0.00
Do Not Understand	0	0.00
Very Misunderstood	0	0.00
Total	25	100.00

Source: Field data, 2024

Before the training, the residents of Sungsang 4 Village had limited awareness of the potential for processing shrimp shell waste. Following the training, 80% of participants reported a thorough understanding, while 20% indicated they had gained a good understanding. These results demonstrate the effectiveness of the program in enhancing community knowledge.

Table 3. Evaluation of Suitability to Community Needs

Suitability to Community Needs	Frequency	Percentage (%)
Very Suitable	25	100.00
Suitable	0	0.00
Neutral	0	0.00
Unsuitable	0	0.00
Very Unsuitable	0	0.00
Total	25	100.00

Source: Field data, 2024

The survey results indicate that all participants found the training highly relevant to their needs. Previously, shrimp shell waste was often regarded as mere waste. Through this training, participants acquired valuable knowledge and skills that can be applied to enhance the added value of fishery products, thereby supporting the sustainable economic growth of the local community.

Discussion

This community service initiative aimed to transform shrimp shell waste into a value-added product in the form of shrimp powder broth in Sungsang IV Village. The results of the program indicate a significant positive impact on community awareness and their ability to manage fishery waste. This training, which combined theoretical knowledge with practical applications, successfully altered the community's perception of shrimp shell waste—from being considered worthless to representing a new economic opportunity. This approach aligns with Marlini (2014), who asserts that processing waste into economically valuable products can mitigate pollution and support environmental sustainability.

The improvement in participants' understanding was evident in the evaluation data, where 80% of participants reported a thorough understanding of the material, while 20% indicated they understood it well. This outcome demonstrates the effectiveness of the training approach. Moreover, direct participation in the shrimp powder broth production process provided participants with hands-on experience, enhancing both their skills and confidence to apply their knowledge in practical settings. This finding is consistent with the research of Hidayat et al. (2021), which suggests that practical training can significantly enhance community knowledge and skills in converting waste into value-added products.

From an economic standpoint, processing shrimp shell waste into shrimp powder broth not only creates new business opportunities but also increases the added value of fishery products in Sungsang IV Village. Previously, shrimp shell waste was often discarded, contributing to environmental issues. In many cases, it was improperly disposed of under houses, in rivers, and along roadsides, creating a strong odor and contributing to pollution. With this training, however, participants have learned to repurpose this waste into a high-value product, thereby reducing environmental contamination. As a result, shrimp shell waste is no longer discarded irresponsibly; instead, it is processed into an economically viable commodity that can be sold both locally and online. This aligns with the concept of added value in production theory, as discussed by Purwanto and Hikmah (2023), which posits that transforming waste into economically viable products can sustainably support the local economy.

This community service initiative has significantly reduced shrimp shell waste, which was previously discarded under houses, into rivers, and along roadsides, causing strong odors and environmental pollution. After learning the process of converting shrimp shell waste into healthy shrimp powder broth, the community has stopped disposing of shrimp shells irresponsibly. Instead, they can now establish shrimp shell-based businesses, selling their products both locally and online. Future training sessions

will focus on marketing strategies for shrimp powder broth to enhance business sustainability. This initiative is designed to be continuous and long-term, ensuring ongoing benefits for the community.

The adoption of simple processing technology was another key factor in the success of this initiative. Participants were taught easy-to-implement techniques, including cleaning, drying, and grinding shrimp shells into powder. This process requires minimal equipment, allowing for straightforward adaptation by the local community. This aligns with the findings of Puspitasari et al. (2022), who emphasize the role of appropriate technology in supporting small-scale, ecologically sustainable businesses.

Beyond the technical aspects, this initiative also had a positive social impact. Throughout the training, participants engaged in discussions and exchanged ideas on expanding fisheries-based businesses. The concluding discussion session broadened participants' perspectives on the importance of collaboration in developing new business opportunities. Strengthening social and economic networks within the community is essential, as highlighted by Indartik et al. (2018), who stress the importance of collaboration among business stakeholders in waste management efforts.

Despite its success, this initiative faced several challenges, particularly in ensuring a consistent supply of raw materials and improving product packaging to enhance market appeal. To address these challenges, the service team recommended forming partnerships with other fisheries business actors to secure raw material supplies and providing additional training on product packaging design to enhance market competitiveness. These strategies align with the research of Suraya et al. (2021), which emphasizes product diversification and packaging improvements as critical factors for sustaining small-scale waste-based enterprises.

The relevance of this initiative to community needs was overwhelmingly positive, as evidenced by the evaluation results, in which 100% of participants deemed the training highly relevant. In addition to generating income, this initiative promotes environmentally sustainable waste management. Thus, the program's impact extends beyond economic benefits to encompass environmental sustainability in the region.

The success of this initiative was largely attributed to effective collaboration among the implementation team, students, and the local community. The involvement of students as facilitators contributed to an engaging and interactive training environment, enhancing participants' comprehension of the material. Furthermore, student participation had the added benefit of fostering soft skills development, particularly in communication and community empowerment. Marlini (2014) underscores the significance of cross-sector collaboration in ensuring the success of community-based waste management initiatives.

Moving forward, continuous support is necessary to ensure that participants can successfully apply their newly acquired skills. This support should also extend to product marketing, including the introduction of digital platforms to expand market reach. By doing so, shrimp powder broth products from Sungsang IV Village may gain a competitive edge in broader markets. Future training sessions will focus on marketing strategies to

further develop the shrimp powder broth business. This strategy aligns with Yani et al. (2018), who emphasize that improved market access is essential for the sustainability of waste-based businesses.

Overall, this initiative has made a tangible contribution to improving the livelihoods of Sungsang IV Village residents. The transformation of waste into value-added products not only increases household income but also provides a sustainable solution for waste management. With continued innovation and collaboration, Sungsang IV Village has the potential to serve as a model for other communities in the sustainable and environmentally responsible utilization of fishery resources.

CONCLUSION

Overall, this community service program successfully enhanced participants' understanding and skills in processing shrimp shell waste into a value-added product, namely shrimp powder broth. Based on the evaluation results, 96% of participants considered this activity highly important, while 4% regarded it as important, and none found it irrelevant. Furthermore, 80% of participants reported a comprehensive understanding of the material, while 20% stated they understood it well, demonstrating the effectiveness of the training in increasing community knowledge. Additionally, all participants agreed that the training was highly relevant to their needs.

As a follow-up initiative, the next phase will focus on developing marketing strategies for shrimp powder broth, both through direct sales and digital platforms. Moreover, a continuous mentoring program will be implemented to ensure that participants can effectively apply the knowledge they have acquired. With sustained support, it is anticipated that the community will be able to establish waste-based fisheries businesses and enhance their economic well-being independently.

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REFERENCES

Hidayat, R., Luktiana, F. Y., & Anisa, R. (2021). Pendampingan Pemanfaatan Sampah Plastik Menjadi Produk yang Memiliki Nilai Tambah. *Jurnal Ilmiah Pengabdian Kepada Masyarakat*, 3(1), 151-158.

Indartik, S., Suryandari, Y. E., Djaenudin, D., & Pribadi, A. M. (2018). Penanganan Sampah Rumah Tangga di Bandung: Nilai Tambah dan Potensi Ekonomi. *Jurnal Penelitian Sosial dan Ekonomi Kehutanan*, 15(3), 195-211.

Marlini, N. (2014). Pemanfaatan Limbah Rumah Tangga (Sampah Anorganik) Sebagai Bentuk Implementasi dari Pendidikan Lingkungan Hidup. *Jurnal Formatif*, 4(2), 124-132.

Pratiwi, I., Kurniasari, D., & Azaliyah, S. (2022). Efektivitas Kulit Udang (Metapenaeus Monoceros) Sebagai Biokoagulan Pada Air Sungai Kelekar Menjadi Air Bersih (Studi Kasus : Air Sungai Kelekar Sebagai Air Bersih di Intake Water Plant Pltgu Indralaya). *Kinetika*, *13*(1), 1–15.

Purwanto, S., & Hikmah, D. (2023). Pemanfaatan Limbah Plastik Menjadi Biji Plastik yang Bernilai Tambah Ekonomi di Kelurahan Dadap Tangerang. *Jurnal Pengabdian Kepada Masyarakat*, 2(1), 171-181.

Puspitasari, N., Hidayat, N., & Setyawati, K. I. (2022). Ecopreneurship Berbasis Pengelolaan Sampah dan Penciptaan Nilai Tambah Ekonomi. *Jurnal Pengabdian Masyarakat Akademisi*, 1(1), 1-8.

Riadi, M. S., Asni, A., & Kasmawati, K. (2021). Fortifikasi Kulit Udang Vaname (Litopenaeus vannamei) pada Ekado. *Seminar Ilmiah Nasional Fakultas Perikanan Dan Ilmu Kelautan Universitas Muslim Indonesia "Inovasi Teknologi Perikanan Dan Ilmu Kelautan Untuk Kemaslahatan Bangsa Di Tengah Pandemi Covid-19"*, *6*, 48–60. http://103.133.36.78/index.php/SemINasFPIKUMI/article/view/181%0Ahttp://103.133.36.78/index.php/SemINasFPIKUMI/article/download/181/177.

Suraya, F., Safitri, E. A., Maulana, W. R., Pratama, F. A., & Nafisah, D. (2021). Revitalisasi TPS 3R melalui Penyuluhan Pengelolaan Sampah dan Pelatihan Pembuatan Kompos dari Sampah Organik. *Jurnal Puruhita*, 3(1), 22-30.

Wowor, A. R. Y., Bagau, B., Untu, I., & Liwe, H. (2015). Kandungan Protein Kasar, Kalsium, dan Fosfor Tepung Limbah Udang sebagai Bahan Pakan yang Diolah dengan Asam Asetat (CH3COOH). *Zootrek Journal*, *35*(1), 1–9.

Yani, S. A., Nugrahaningsih, H., & Madjid, R. (2018). Program Pengabdian Kepada Masyarakat: Pemanfaatan Limbah Sampah untuk Meningkatkan Pendapatan Rumah Tangga Kampung Cilongok Desa Kiarasari Kecamatan Sukajaya Kabupaten Bogor Jawa Barat. *Jurnal Berdikari*, 1(1), 1-5