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Diversification of Papaya Processing for Independence and Economic Improvement of the Lumpang Sewu Farmer

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Abstract

Ponggok Village, Blitar Regency, is one of the papaya production centers in East Java with abundant harvests every year. Unfortunately, most papayas are only sold fresh without further processing, and even young papayas and their skins are often wasted. This problem continues to occur every year. Therefore, this community service program aims to empower the Lumpang Sewu Farmer Group through training in the production of economically valuable papaya products. The products developed include papaya floss, papaya chips, papaya candy, and eco-enzymes from papaya peels. The program was implemented through observation, preparation of tools and materials, product testing, training, and business evaluation and assistance. The results of the activities show a significant increase in the knowledge and skills of the participants, as evidenced by the pretest and posttest results and participant testimonials. All participants stated that they were 100% capable of producing the products, and 95% were interested in selling them. This program not only provides practical skills but also encourages economic independence and the sustainable utilization of local potential.

Keywords: *Candy; Chips; Eco-Enzyme; Lumpang Sewu; Papaya*

Introduction

East Java Province produced 349,998 tons of papaya in 2023 (Badan Pusat Statistik Provinsi Jawa Timur, 2023). Blitar Regency contributed 89,974 quintals, an increase of 14.8% compared to 2022 (Badan Pusat Statistik Kabupaten Blitar, 2024). These figures highlight Blitar's position as one of the main papaya centers in East Java, with Ponggok Village as one of its contributors. The agricultural sector in Indonesia is not only used as a source of livelihood for the population, but can also be used to boost the Indonesian economy (Kusumaningrum, 2019). As a village that produces a significant amount of papaya, it is unfortunate that the majority of the harvest is only sold as fresh fruit without further processing. Indeed, unmarketable young papayas that

fail the sorting process are frequently discarded. This shows that the potential of young papaya has not been optimally utilized. In addition, rotting papaya waste can cause new pollution if left unattended (Arbiraya et al., 2022; Masjud et al., 2022). In fact, papaya waste can be utilized to produce high-value products. Therefore, community service or entrepreneurship training activities can be an important means of changing the mindset of rural communities, which tend to rely on traditional agriculture, towards the development of more diverse and innovative micro, small, and medium enterprises (MSMEs) (Abdillah et al., 2023).

The underutilization of papaya fruit (Carica papaya L.) is a major problem faced by our partners, the Lumpang Sewu Farmer Group in Ponggok Village. This group consists of local farmers who mainly sell papayas as fresh fruit without processing. Most members of the farmer group only sell papaya in the form of fresh fruit without processing. This results in low selling prices, especially during the harvest season when abundant supply causes market prices to fall. In addition, young papaya fruits that do not pass the sorting process are often simply discarded along with their skins on vacant land to be used as fertilizer. However, the composting process generally requires a large area of land in order to work properly. The impact on the composting process is an unpleasant odor (Masjud et al., 2022). This is unfortunate, considering that papaya fruit has a high nutritional content, including calories, carbohydrates, protein, fat, fiber, antioxidants, vitamin A, vitamin B1, vitamin B2, vitamin B3, vitamin B5, vitamin B6, folic acid, vitamin C, vitamin E, and vitamin K (Arbiraya et al., 2022; Astriany et al., 2024). Similar findings have been highlighted in the International Journal of Social Research (IJSR), where community-based agricultural programs were proven to enhance household food security and foster economic independence (Rahman et al., 2020; Nugroho et al., 2021). These studies emphasize the importance of empowering farmer groups to shift from traditional practices to more innovative and sustainable approaches.

As a concrete effort to address the challenge of low utilization of papaya harvests, the community service team designed an integrated approach through product diversification and simple technologies that are adaptable to rural conditions and can be implemented by members of the Lumpang Sewu farmer group in Ponggok Village (Koul et al., 2022; Mannahali et al., 2024). This community service activity not only provided technical training, but also encouraged a new mindset in viewing waste as a natural resource with economic value. These innovations include the use of eco-enzymes, flavor exploration for papaya floss, chips, papaya

candy, and drying techniques for papaya. These solutions are combined with mentoring methods and hands-on field practice. Training participants are involved in the production process, testing, and simple marketing simulations. This is in line with relevant community service research, namely that project-based training programs have been proven to improve the community's competence in producing innovative products (Duda et al., 2024). Therefore, this community service program is expected to build the community's capacity for entrepreneurship (Mannahali et al., 2024).

Eco-enzymes are an alternative waste management method that can be used to recycle fruit and vegetable peels that are no longer used (Agustinur et al., 2024). Eco-enzymes have the potential to overcome waste-related challenges. Good eco-enzymes should have a fresh sour aroma, brown color, and pH below 4 (Amadea et al., 2025). Research shows that eco-enzymes made from a mixture of papaya and spinach can reduce nitrite concentrations in water samples. The application of 0%, 2%, 4%, and 6% eco enzyme for 10 hours of exposure showed nitrite removal rates of 0.3%, 20%, 29%, and 35%, respectively. The longer the exposure time to eco-enzymes, the greater the effect of nitrite reduction concentration in water. The study proved that eco-enzyme applications made from organic waste can be an alternative solution to waste and wastewater quality issues (Wikaningrum et al., 2022).

Methods

This community service activity was carried out in Ponggok Village, Blitar Regency, East Java. The service team partnered with the Lumpang Sewu farmer group, which consists of 40 active members. The implementation stage of this service took the form of training and assistance in making processed papaya products as well as assistance in obtaining business licenses. The community service program in Ponggok Village was designed to promote economic independence among farmer groups by training them to process papaya into value-added products (Mannahali et al., 2024). The entire series of activities focused on practical, step-by-step empowerment, from preparation and training implementation to business development support. This approach allows participants to not only gain technical skills, but also receive guidance in developing products that utilize local potential, as well as assistance in obtaining business licenses (Duda et al., 2024).

Table 1. Program Implementation

Stage 1. Field observation	
Activities	- Location survey - Team and farmer group leader coordination by FGD - Determine the date of the training
Objective(s)	Discussion about the selection of training location
Stage 2. Tool making and testing	
Activities	- Discussion with team about budget - Prepare tools and materials - Making products for trial
Objective(s)	Ensure the product does not fail
Stage 3. Prepare for the implementation	
Activities	- Products packaging to be distributed to the participants - Prepare tools and materials
Objective(s)	Ensure the products are good to eat (foods) and useful (eco-enzyme)
Stage 4. Implementation of training and demonstration	
Activities	- Opening and introduction of the products - Distribution of materials to the participants - Demonstration of making products started with papaya candy, papaya abon, papaya chips, and eco enzyme - Completion of questionnaires in the form of pretest and posttest by participants - Introducing the potential of the Lumpang Sewu Farmer Group to utilizing their commodity, papaya - Introducing economic opportunities for processed papaya products
Objective(s)	- Providing insight into the process of making papaya abon, papaya candy, papaya chips, and eco enzyme - Invite participants to make papaya abon, papaya candy, papaya chips, and eco enzyme - Evaluate the benefits of product manufacturing training
Stage 5. Evaluation and mentoring	
Activities	- Asking questions as testimony - Reporting progress of making products by Whatsapp group - Determination of products to be sold - Assistance the Lumpang Sewu Farmer Group to apply business license
Objective(s)	- Strengthen participants' confidence in their skills to process papaya fruit and sell it independently

The implementation of this community service program was carried out through several structured stages (Table 1). All activities were carried out in a participatory and practical manner by directly involving members of the Lumpang Sewu Farmer Group in Ponggok Village. The training focused on processing papaya fruit into various value-added products such as eco-enzymes, papaya floss, papaya chips, and papaya candy. The impact assessment of the program is based on the involvement and development of participants, which is monitored through discussions, questionnaires, and regular reports via WhatsApp groups. The questionnaire contains satisfaction and knowledge indicators ranging from 1 to 4 (the higher the number, the more satisfied or knowledgeable the respondent is). This approach allows for continuous feedback and adaptive assistance according to the participants' needs. The program not only aims to improve technical skills, but also supports the business licensing process to encourage the formation of independent and sustainable agribusinesses (Sanawiri & Amrulla, 2025).

Results and Discussions

The implementation of the community service program in Ponggok Village, Blitar Regency, has been systematically designed through five main stages, starting from field observation to evaluation and mentoring. Each stage plays an important role in ensuring that activities are not merely ceremonial, but truly have a sustainable impact on the Lumpang Sewu Farmer Group (Pamungkas et al 2019). Products were made together with participants, and each product was made individually (Figure 1).

(a) (b) (c) (d)

Figure 1. Economically Valuable Products from Papaya Fruit and Peel Waste:
(a) Papaya Floss; (b) Papaya Chips; (c) Papaya Candy; (d) Papaya Eco-enzyme

The demonstration was held at the Ponggok Village Hall for approximately 4.5 hours and was attended by 40 people. After the opening, farmer group members were immediately

invited to make their products so that participants could easily understand the steps involved (Figure 2). Flyers containing the manufacturing procedure were distributed before the activity began, so that participants had an initial overview (flyer link: https://bit.ly/3GCiwwZ). Participants were very enthusiastic about this activity. According to one participant, "This activity is very useful. There has never been an activity like this before. I am interested in selling papaya candy," said Mrs. Utami.

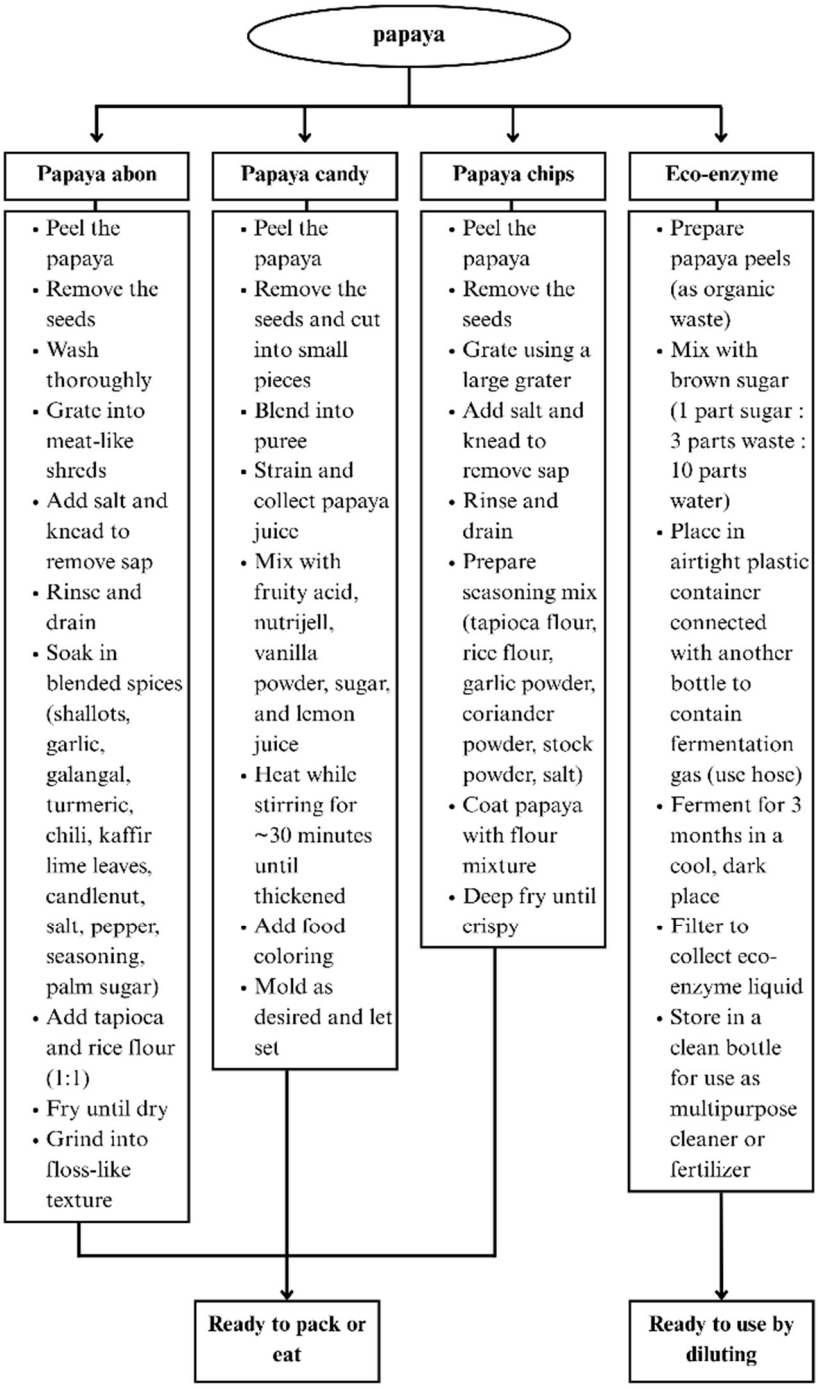

Figure 2. Products Manufacturing Process

The results of the pretest and posttest questionnaires and testimonials show that this activity was successful. This can be seen from the percentage of participants' knowledge before and after the activity. Participants were ensured to fully understand how to make the products. Based on the questionnaire results, 100% of training participants stated that they were able to make these products. Interest in making and selling these products was high (Figure 3).

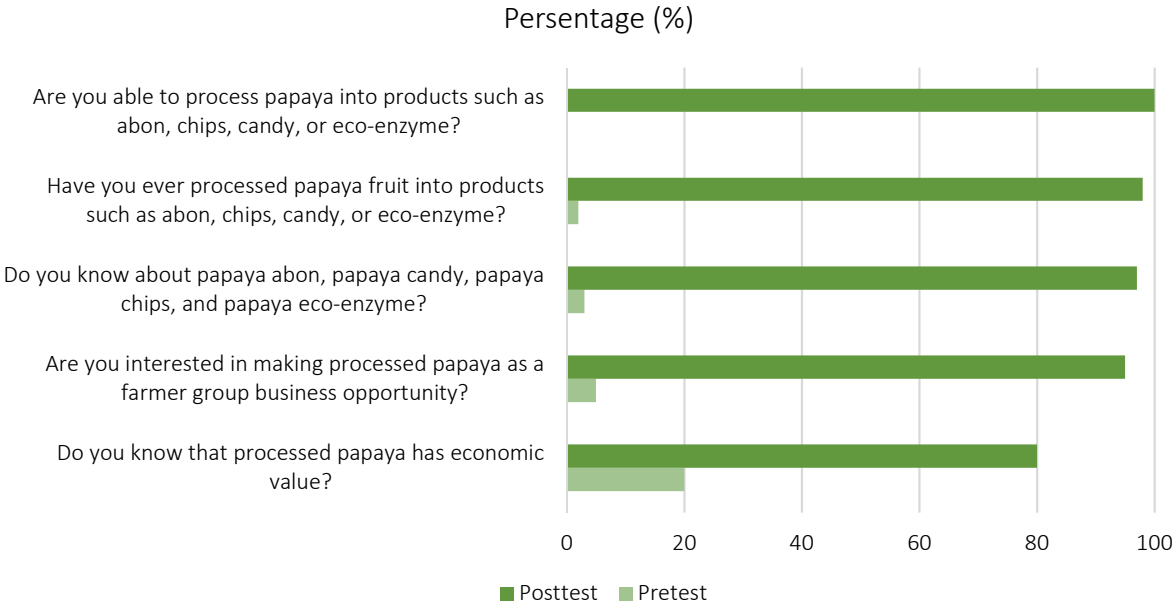

Figure 3. Questionnaire Results

The implementation of training and mentoring activities on papaya processing for the Lumpang Sewu Farmer Group showed significant success, both in terms of increasing individual capacity and local economic potential. The participatory method yielded results in the form of enthusiasm from participants during the 4.5-hour product demonstration. Participants not only listened but also directly practiced making eco-enzymes, papaya shredded, papaya chips, and papaya candy in sequence. The increase in participants' knowledge and skills was clearly evident from the pretest and posttest results. All participants stated that they were confident in their ability to reproduce the processed products they had learned. This demonstrates the effectiveness of a practical approach to knowledge transfer, in line with the concept of community-based training that emphasizes hands-on experience. In addition, participant testimonials reinforce the impact of the program, particularly on interest in the production and marketing of papaya candy as one of the most popular products.

This activity also had an impact on the motivation of farmer groups to develop integrated agriculture-based businesses. Assistance with business licensing was an important step in promoting the sustainability and legality of small businesses based on local commodities (Kristiyanti et. al., 2024). Beyond technical aspects, this activity strengthens community networks and confidence in entrepreneurship, opens opportunities for economic diversification, and reduces dependence on fresh fruit sales alone. Thus, this community service program has been successful not only in terms of training but also in building awareness of local potential and business opportunities that had not been optimally explored. This success serves as an important foundation for replicating the program in other villages with similar commodity characteristics.

Conclusion

This community service program successfully improved the skills and knowledge of members of the Lumpang Sewu Farmer Group in Ponggok Village, Blitar Regency, in managing papaya fruit and its peel waste to be turned into economically valuable products such as eco-enzymes, papaya flakes, papaya chips, and papaya candy. This is demonstrated by the results of the pretest and posttest, which showed a significant increase in knowledge of 98% regarding the processing of papaya into four products, so that 100% of the training participants were able to make eco-enzyme products, papaya floss, papaya chips, and papaya candy. These results were also supported by enthusiastic testimonials from participants, 95% of whom expressed interest in producing and selling these processed products. Thus, this training also provided benefits in the form of awareness of local potential, encouraged agricultural-based entrepreneurship, and addressed the challenges of low selling prices for papayas and wasted papaya peel waste. Follow-up assistance, including in the area of business legality, is expected to help the Lumpang Sewu Farmer Group become more economically independent and contribute to strengthening the community's food security in a sustainable manner.

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