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Revitalization and Commercialization of SMEs Products in Gampong Umong Seuribee, Aceh Besar Regency through Papaya Chips

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ABSTRACT

This community service program was conducted in Gampong Umong Seuribee, Aceh Besar, to address the underutilization of abundant local papaya harvests, which were traditionally sold raw at low prices. The program aimed to revitalize and commercialize papaya as a value-added product through the production of papaya chips, thereby improving household income and fostering local entrepreneurship. Twenty-five women participated in training sessions covering hygienic food processing, appropriate use of drying and frying equipment, packaging design, and basic marketing strategies. The activities employed a participatory approach, combining demonstrations, hands-on practice, and mentoring. Results showed a significant increase in participants' skills, with over 90% mastering production techniques and more than 80% ready to market the product. The initiative successfully established a distinctive village brand and created a foundation for sustainable microenterprise development, contributing to economic empowerment and aligning with sustainable development goals on poverty reduction, decent work, and responsible production.

1. Introduction

Globally, agricultural diversification and value addition to farm products have been recognized as key strategies for enhancing rural livelihoods, reducing post-harvest losses, and promoting sustainable economic growth (FAO, 2023; Van Dijk et al., 2022). In many developing countries, communities with abundant agricultural resources often face the paradox of low economic returns due to limited processing capacity, inadequate market access, and a lack of product innovation (Nair & Nair, 2021). The papaya (*Carica papaya L.*), a tropical fruit with high nutritional value and diverse

processing potential, remains underutilized in many rural areas despite its wide availability (Sivakumar et al., 2020). This challenge is particularly relevant in the context of the United Nations Sustainable Development Goals (SDGs), specifically Goal 1 (No Poverty), Goal 8 (Decent Work and Economic Growth), and Goal 12 (Responsible Consumption and Production). The inability to transform raw agricultural produce into competitive, value-added products hinders community economic development and contributes to persistent rural poverty.

In Indonesia, rural communities often depend on seasonal crops for income, but the absence of agro-processing initiatives results in low product value and unstable earnings (Purwanto et al., 2023). This situation is observed in Gampong Umong Seuribee, Aceh Besar, where papaya cultivation thrives due to favorable agro-climatic conditions. Despite abundant production, papayas are typically sold in raw form at low prices, yielding minimal profit margins. Without intervention, such practices perpetuate economic vulnerability and limit opportunities for rural entrepreneurship (Kusnandar et al., 2022). Furthermore, the lack of post-harvest technology exacerbates food waste, undermining sustainability efforts and directly conflicting with SDG targets related to resource efficiency and waste reduction.

Previous studies on rural agro-product commercialization demonstrate that introducing innovative food processing technologies and entrepreneurship training can significantly boost community income, strengthen social capital, and enhance food security (Rahman et al., 2021; Pandey et al., 2022; Aqil et al., 2025; bin Abd Karim et al., 2024; Fadhil et al., 2025; Halim et al., 2024; Halim, Kesuma, Siregar, Riyaldi, et al., 2023; Halim, Kesuma, Siregar, Syahrizal, et al., 2023; Halim, Lubis, et al., 2025; Halim, Riyaldi, et al., 2025; Hanidah et al., 2024; Lubis et al., 2025; Rivani et al., 2024, 2025). For example, papaya chips, produced through proper dehydration and frying techniques, not only extend the fruit's shelf life but also create high-value snack products that appeal to broader markets (Singh et al., 2021). Community service projects in various regions of Southeast Asia have successfully applied similar strategies to empower women's groups, improve household income, and foster local brand identity (Nguyen et al., 2020). However, despite these successes, many rural areas in Aceh have yet to adopt such approaches, creating a clear gap between potential and practice.

The gap analysis reveals two critical issues: (1) the absence of product innovation and value addition in papaya cultivation in Umong Seuribee, and (2) the lack of structured entrepreneurship capacity-building programs for local residents, particularly women. Addressing these issues requires an integrated approach combining post-harvest processing technology, business model innovation, and local capacity development—elements that have proven effective in comparable rural contexts (Wahyuni et al., 2023). This community service initiative introduces a novel approach by not only providing technical training in papaya chip production but also embedding market-oriented strategies, branding, and sustainable production principles aligned with SDG frameworks.

The primary objective of this program is to revitalize and commercialize the papaya as the village's signature product, transforming it into a competitive, marketable commodity that contributes to household income and community economic resilience. The purpose of this article is to document the implementation process, highlight the technical and entrepreneurial innovations applied, and evaluate the outcomes in the context of rural development and SDG achievement. The contribution of this work is twofold: (a) for science and technology, it provides a replicable model for integrating agro-processing technology with community-based entrepreneurship; and (b) for SDG achievement, it advances targets related to poverty reduction, sustainable production, and inclusive economic growth.

2. Methods

The target community for this program was the residents of Gampong Umong Seuribee, a rural village located in Lhoong Subdistrict, Aceh Besar Regency, Aceh Province, Indonesia. The village has a population of approximately 520 people, with the majority relying on small-scale farming and plantation activities as their main source of income. Papaya (*Carica papaya* L.) is one of the most abundant local commodities, favored by the region's tropical climate and fertile soils. However, most of the produce is sold in raw form without any value addition, resulting in low economic returns for households. The main participants in this program were 25 women, predominantly housewives, who play a significant role in food preparation and small-scale economic activities. They were directly involved in training sessions, hands-on production, and feedback collection to ensure that the program met community needs.

The activity was implemented by a multidisciplinary team from Universitas Syiah Kuala's Community Service Program (Kuliah Kerja Nyata/KKN) Group 12, supported by faculty members with expertise in food technology, business and marketing, and community development. The food technology experts were responsible for introducing papaya processing techniques, food safety protocols, and shelf-life extension methods. Business and marketing specialists provided guidance on entrepreneurship, cost analysis, branding, and market access. The community development team facilitated inclusive participation and ensured that the program addressed local aspirations. In total, twelve student facilitators were assigned to small groups to provide personalized mentoring, equipment setup, and data collection.

The implementation process was conducted over a four-week period, beginning with a preliminary assessment to identify challenges and opportunities in papaya production and marketing. This stage involved field visits, informal interviews with local farmers, and baseline surveys to measure household income from papaya sales and existing knowledge of food processing. Following the assessment, a two-day capacity-building workshop was organized, combining theoretical and practical sessions. Participants learned about the nutritional value of papaya, principles of hygienic processing, slicing and drying techniques, frying methods for achieving crispness, seasoning preparation, and proper packaging.

As part of the technology transfer, the program introduced low-cost, energy-efficient dehydrators and food-grade packaging materials to enhance product quality and extend shelf life to up to three months. Entrepreneurship training was also integrated, covering production cost calculations, pricing strategies, brand identity creation, and market entry approaches. After the training, participants engaged in pilot production runs, during which they produced papaya chips for consumer testing. Feedback was gathered from thirty local residents who evaluated the products based on taste, texture, and appearance.

The instruments and materials used included manual slicers, stainless steel knives, energy-efficient dehydrators, frying pans, temperature-controlled stoves, digital kitchen scales, thermometers, heat sealers, polypropylene packaging, and labeling materials. Data collection techniques comprised direct observation to monitor skill acquisition, structured interviews to capture participants' perceptions, and sensory evaluations for consumer acceptance testing. The success of the program was measured through four main indicators: increased knowledge of food safety and processing techniques, ability to produce papaya chips independently according to quality standards, readiness to package and label products for sale, and projected increases in income compared to selling raw papaya.



Figure 1. Papaya chips production process

Quantitative data from pre- and post-training questionnaires were analyzed using paired t-tests to assess significant improvements in knowledge and skills, while qualitative data from interviews and observations were analyzed using thematic coding to identify common experiences, challenges, and potential for sustainability. This comprehensive approach ensured that the program's impact could be evaluated both in terms of skill development and economic potential, while also providing evidence for replication in other rural communities.

3. Result and Discussion

The implementation of the community service program in Gampong Umong Seuribee yielded notable improvements in participants' knowledge, skills, and readiness to commercialize papaya chips as a value-added product. Based on pre- and post-training assessments, participants demonstrated significant progress in food processing techniques, packaging quality, and basic entrepreneurial skills. Out of the 25 women involved, 92% were able to independently produce papaya chips according to hygiene and taste standards, compared to only 8% who had prior exposure to food processing techniques.

Table 1. Indicators of success in community service activities

Indicator	Baseline (%)	Post-Training (%)	Change (%)
Knowledge of hygienic food processing	16	96	+80
Ability to operate dehydration and frying equipment	12	92	+80
Ability to package and label products	0	88	+88
Readiness to market products	4	84	+80
Projected income increase from papaya sales	—	+45*	—

*Estimated based on cost–benefit analysis and market price comparisons

These results indicate that the program effectively addressed the identified gap: the lack of value-added processing skills that constrained economic potential from papaya production. Similar findings have been reported in rural community empowerment programs in Southeast Asia, where the introduction of simple processing technologies significantly improved household incomes and market competitiveness (Rahman et al., 2022; Nguyen & Vo, 2021).



Figure 2. Documentation after program

The success of the training is closely aligned with SDG 1 (*No Poverty*), SDG 8 (*Decent Work and Economic Growth*), and SDG 12 (*Responsible Consumption and Production*). By equipping participants with technical and entrepreneurial competencies, the program has laid a foundation for sustainable microenterprise development. In line with the value chain approach suggested by FAO (2020), the intervention not only enhanced production capacity but also strengthened market linkages, as evidenced by participants' readiness to introduce the product to local stores and online platforms. One of the most significant achievements was the creation of a distinctive village brand identity for the papaya chips, incorporating local cultural motifs into the packaging design. This branding strategy aligns with market differentiation theories (Kotler & Keller, 2021), which emphasize the importance of unique product positioning for small-scale producers. In addition, the program's sensory evaluation results showed that 87% of consumer testers rated the papaya chips as "very good" in terms of taste, texture, and appearance.

Nevertheless, certain obstacles were encountered during the program. Seasonal fluctuations in papaya supply posed a potential challenge for continuous production, echoing supply chain constraints identified in similar rural agro-processing initiatives (Hernandez et al., 2019). Another barrier was the limited access to capital for scaling up production, a common issue in microenterprise development (UNDP, 2022). While these factors were beyond the control of the implementation

team, mitigation strategies such as encouraging collective marketing groups and exploring microfinance opportunities were discussed with participants.

Overall, the program demonstrated that community-driven training, supported by appropriate technology and entrepreneurial guidance, can revitalize underutilized local resources into competitive market products. The approach has the potential to serve as a replicable best practice for other rural areas with abundant but undervalued agricultural commodities.

4. Conclusion

The community service program on the revitalization and commercialization of papaya-based products in Gampong Umong Seuribee has successfully met its primary objectives of enhancing local capacity in food processing, improving product quality, and strengthening entrepreneurial readiness. Training outcomes showed substantial gains in participants' skills, with over 90% mastering hygienic production techniques and more than 80% demonstrating readiness to market papaya chips, reflecting a clear transformation from raw material sellers to value-added producers.

The program's impacts extend beyond immediate skill acquisition. By introducing appropriate food processing technology, standardized packaging, and basic marketing strategies, the initiative has laid the groundwork for sustainable microenterprise development. These achievements directly contribute to the advancement of SDG 1 (*No Poverty*), SDG 8 (*Decent Work and Economic Growth*), and SDG 12 (*Responsible Consumption and Production*). Moreover, the establishment of a distinctive village brand identity positions Gampong Umong Seuribee for long-term market competitiveness.

In broader terms, this initiative demonstrates that community-driven empowerment programs, when combined with relevant technology transfer and entrepreneurial guidance, can effectively transform underutilized agricultural resources into high-value products. The model developed here can be adapted and replicated in other rural contexts, offering a viable pathway to economic resilience and sustainable rural development.

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