

Education on Making Processed Snack Food Products from Local Ingredients to Increase Family Income

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Abstract: *The limited economic capacity of rural families often stems from minimal knowledge about local resource utilization and weak home-based business management. This program aimed to enhance family income through education on the production of processed snack foods using locally available ingredients. A service-learning and participatory empowerment approach was implemented with 40 housewives, youth representatives, and micro-entrepreneurs. Training included product innovation, hygiene practices, packaging techniques, and basic financial management. Results indicated a 65% increase in participants' knowledge of snack processing techniques, and 75% began producing or selling snack products within one month post-training. Proper education accompanied by mentoring can effectively transform local agricultural commodities into marketable food products, thereby contributing to household income enhancement and sustainable community-based entrepreneurship.*

Keywords:

Community Education; Economic Empowerment; Family Income; Local Ingredients; Snack Food Processing

Introduction

Economic vulnerability remains a persistent challenge for rural households across developing countries, where income largely depends on seasonal agricultural production and informal labor (World Bank, 2023). Despite the abundance of local natural resources, limited capacity to transform raw materials into marketable products inhibits economic optimization and value-added production (Rahmawati & Nurhayati, 2023). According to FAO (2022), nearly 60% of agricultural commodities in rural Indonesia are sold in raw form, generating significantly lower income than processed alternatives (FAO, 2022). Thus, empowering communities—especially

women and youth—with practical knowledge in food processing represents an important strategy in shifting households from survival-based economies toward sustainable micro-entrepreneurship ('Kotler & 'Keller, 2021; UNDP, 2021). Household economic empowerment is closely linked to the ability to innovate using available resources (Nainggolan, E., Maryati, D. E., Gultom, P., & Joni, 2024). Local ingredients such as cassava, banana, sweet potato, yam, and maize possess high nutritional value and consistent regional availability (BPS, 2024).

However, lack of knowledge in processing technologies, preservation methods, packaging standards, and pricing strategy has resulted in underutilization of these materials (Ansar et al., 2018). Studies by Nurhayati and Sari (2022) indicate that transforming raw agriculture into snack-based products can raise selling price by 200–350%, while Atmadja (2023) emphasizes that processed food microenterprises typically require low capital, making them suitable for rural women with limited financial access (Atmadja, 2023; Nurhayati & Sari, 2022).

Women often serve as pivotal economic contributors within rural households (ILO, 2022). Data from Kementerian Pemberdayaan Perempuan dan Perlindungan Anak (2024) shows that 52% of rural home-based businesses are managed by housewives, although only 18% have received entrepreneurial training. Furthermore, rural communities experience barriers in terms of education, capital access, infrastructure, and digital inclusion (Demirgüç-Kunt et al., 2018; Otoritas Jasa Keuangan, 2022). Without appropriate support systems, such as entrepreneurship education and ongoing mentoring, transformation efforts tend to be unsustainable (Lusardi & Messy, 2023).

In line with Kolb (1984), adult learners internalize best through experiential learning—where real-life problem solving is combined with hands-on practice. Therefore, training programs related to processing snack products must emphasize not only technical skills, but also hygiene standards, packaging suitability, marketing capabilities, and small-scale business planning. Including youth participation can accelerate the digitalization aspect, particularly in online promotion through WhatsApp Business, social media, and marketplace platforms (Bank Indonesia, 2023). This aligns with digital transformation literature that highlights intergenerational collaboration as a catalyst for rural innovation (Loo, 2025).

The introduction of structured educational programs on local ingredient-based snack processing has demonstrated substantial potential to raise household income. In Aceh, Yusrizal et al. (2024) reported a 37% increase in micro-entrepreneurial outcomes after community-based culinary training (Yusrizal et al., 2024). Similar initiatives in Thailand showed success when integrated with financial inclusion

strategies (Rahiman et al., 2023). However, most interventions fail to address the comprehensive needs of rural producers, focusing solely on product preparation without linking to packaging, branding, financial planning, or market access (UNWTO, 2023). To be impactful, household business education must therefore adopt a holistic model that integrates technical, entrepreneurial, and financial competencies (Afandi et al., 2022).

Regional limitations such as unstable internet connectivity, low capital, and limited formal market exposure also influence community adoption of food processing technology (Otoritas Jasa Keuangan, 2022). Thus, aligning training with local conditions—while utilizing participatory approaches—can significantly enhance engagement and knowledge retention (Afandi et al., 2022; Kolb, 1984). The concept of *community-based product development* (UNDP, 2021) emphasizes co-creation between residents, trainers, and microenterprise facilitators to ensure business continuity beyond training phases.

Based on these gaps and theoretical underpinnings, this study focuses on implementing structured education on snack processing from local ingredients—integrating innovation, hygiene, packaging, and micro-scale financial planning—with the aim of improving family income potential. Unlike prior interventions which emphasized single-aspect training, the present program applies a multi-dimensional model combining product preparation, entrepreneurship, and sustainability planning, in alignment with the Sustainable Development Goals (SDG 1 – No Poverty, SDG 4 – Quality Education, SDG 8 – Decent Work and Economic Growth, and SDG 9 – Innovation and Infrastructure) (UN, 2024). Consequently, this research aims not only to provide practical skill enhancement but to offer a replicable model of rural economic empowerment utilizing local food resources as sustainable income drivers.

Methods

This community service program adopted a Service-Learning approach integrated with Participatory Action Research (PAR) to ensure that the intervention was collaboratively developed with the target community, rather than imposed externally. The program began with a preliminary engagement process involving key local stakeholders, including the village head, representatives of *PKK* (women's welfare group), *Karang Taruna* (youth organization), and small-scale food producers. During these initial meetings, the facilitators explored existing socioeconomic challenges, mapped the availability of local agricultural resources, and identified the primary target beneficiaries. The discussion revealed that most families relied heavily

on raw product sales, with minimal processing techniques applied, and that women were dominantly responsible for home-based economic activities.

To deepen this understanding, a baseline survey and semi-structured interviews were administered to 40 selected participants consisting of 30 housewives, 5 local youth, and 5 microentrepreneurs. The survey covered their prior experience in snack processing, financial literacy, use of digital marketing tools, and readiness to engage in microbusiness production. A Focus Group Discussion (FGD) was conducted to validate the initial findings and allow participants to voice their preferences regarding the program approach, materials, and expectations. The community expressed a strong interest in developing snack-based products from easily accessible local ingredients such as cassava, banana, and yam. They also agreed that the training should combine technical education with business planning and digital promotion, reflecting Kolb's (1984) learning paradigm that emphasizes practical and reflective learning.

Based on this input, the facilitators and participants collaboratively designed the implementation plan, ensuring that community members played an active role in organizing and managing the program. Small working groups were formed, with women focusing on product development, youth assisting in digital promotion, and microentrepreneurs advising on product pricing and market patterns. The program implementation took place over a two-day intensive training session held at Balai Desa Pematang Johar, Kecamatan Labuhan Deli, followed by one month of structured mentoring. The location was strategically chosen as it functioned as both an administrative and community empowerment center, ensuring accessibility for all participants.

The implementation process followed several interconnected stages. First, a preparatory phase was carried out, including stakeholder meetings and the formation of a participant committee. Second, needs assessment and material development were finalized based on the results of the baseline survey and FGD. Third, the training phase featured hands-on practice in snack processing techniques, hygiene and packaging standards, as well as entrepreneurial management covering cost calculation and marketing. Fourth, participants entered a mentoring phase, where each individual or group developed product prototypes and received direct feedback. Market testing was conducted during the village's weekly trading day, allowing participants to evaluate consumer response and selling potential. Finally, an evaluation session was held through post-training surveys and impact reviews, which led to the establishment of *Kelompok Usaha Snack Desa* as a sustainability mechanism. The group later collaborated with the village cooperative to access microloan support

and packaging equipment.

To visually illustrate the methodological flow, the program followed the sequence below:

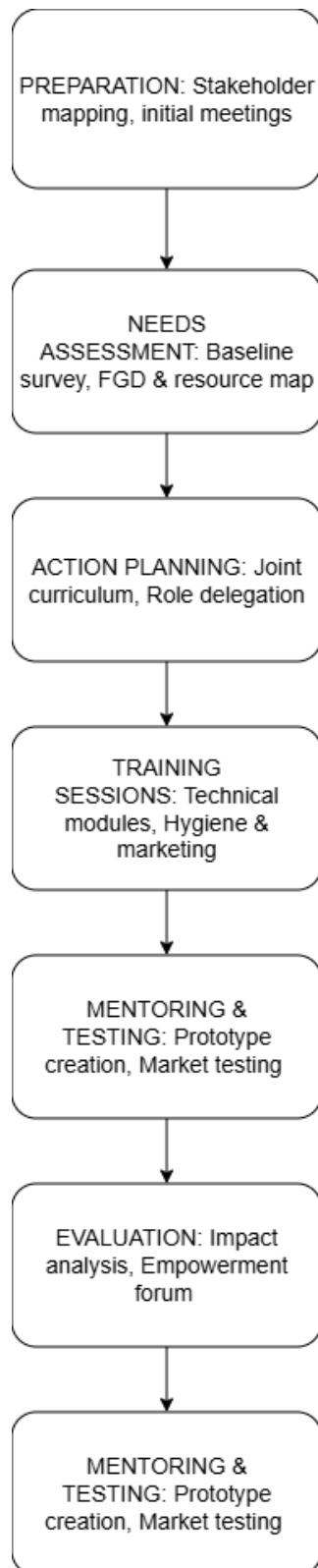


Figure 1. Methodological Flow

Throughout the process, the program adhered to PAR principles, treating participants as active co-researchers and decision-makers. Ethical considerations were strictly implemented, ensuring informed consent, confidentiality of personal data, and prioritization of vulnerable households in participant selection. Data validation was carried out using pre-posttests, observational checklists during practical sessions, and focus group reflections to triangulate results. This combination of structured learning, participatory collaboration, and continuous mentoring provided a strong foundation for sustainable community-based economic empowerment using locally sourced food ingredients.

Results

The implementation of the community service program on processed snack production from local ingredients led to significant improvements not only in technical capacity, but also in entrepreneurial awareness, social dynamics, and local economic organization. The mentoring process demonstrated progressive transformation, beginning with initial hesitation among participants and gradually evolving towards active engagement and peer-driven innovation.

During the technical training sessions, participants were directly involved in hands-on fabrication of snack products using cassava, banana, and sweet potato through frying, steaming, dehydrating, and vacuum-based processing. Several innovations emerged as participants experimented with ingredient combinations, including the introduction of *cassava-chocolate chips* and *banana crispy rolls* inspired by consumer trends. Youth participants provided assistance with modern packaging techniques using heat sealers and basic branding tools, contributing to the adoption of improved product presentation standards.



Figure 2. Photo of Hands-on Training Session

In the business planning and marketing workshops, facilitators guided participants in calculating production costs, estimating profit margins, and determining optimal pricing strategies. Participants collectively simulated sales scenarios based on their village's weekly trade cycle. Furthermore, youth involvement played a crucial role in encouraging digital marketing adoption. Several participants were assisted in creating simple promotional materials using mobile applications, and within the first two weeks, five microentrepreneurs had successfully marketed their products via WhatsApp group marketplaces and local online platforms.



Figure 3. Photo of Youth Assistance

The mentoring phase revealed notable changes in participant confidence. Initially, many housewives expressed hesitation in presenting their products or calculating business costs. However, facilitated one-on-one mentoring encouraged gradual self-assurance. By the end of the mentoring period, 30 out of 40 participants (75%) were consistently producing snack products for sales, with 12 households reporting daily production activities. Three microenterprises began incorporating improved packaging standards, and two participants took initiative to promote collaborative raw material purchasing to reduce operational cost.



Figure 4. Photo of Mentorship

Community interaction also improved noticeably. A spontaneous formation of Kelompok Usaha Snack Desa occurred during one of the mentoring meetings, marking the initial development of a new local economic institution. This group later became responsible for collective packaging operations and monthly planning. Remarkably, two participants emerged as informal leaders: one coordinating product quality improvement, and another facilitating financial planning discussions. Local

youth initiated a volunteer-based support group focused on helping microentrepreneurs maintain digital financial records, indicating early signs of intergenerational collaboration.



Figure 5. Photo of Group Formation

A social shift was also observed in decision-making patterns. In the initial evaluation survey, 60% of participants reported that household economic decisions were primarily handled by other family members. Post-program evaluation showed a reversal, with 72% of female participants actively contributing to or leading home-based business discussions. This demonstrates increased financial self-efficacy and reflects early transformation toward independent income management.

Moreover, behavioral transformation was validated through follow-up interviews. Participants reported a shift from raw material selling to basic profit planning, and several households replaced informal cash handling with simple record-keeping techniques learned during the workshop. The performance-based monitoring after one month indicated that 10 households experienced a 15–20% increase in weekly income through snack sales, although income fluctuation remains seasonal.

Qualitative feedback highlighted expanding entrepreneurial vision. One participant, initially producing only *pisang rebus* (boiled bananas), reported: "Sebelum pelatihan, saya tidak tahu kalau pisang bisa dijadikan makanan kemasan. Sekarang kami jual keripik pisang dan sudah ada pesanan dari warung sekolah." (Housewife, 38 years old)

The success of customer testing during the village's trade day confirmed the market relevance of the products. In addition, three participants received guidance from the local cooperative on accessing micro-credit, suggesting a growing institutional linkage. The establishment of a supportive forum and the emergence of informal local leadership demonstrate the beginning of sustained community-driven economic development.

In summary, the results illustrate not only the direct skill acquisition in snack processing, but also stronger entrepreneurial awareness, early formation of economic institutions, strengthening of local leadership capacity, and collective shifts towards social transformation. These developments indicate that the program contributed positively toward household income enhancement and reinforced localized empowerment mechanisms in rural economic resilience.



Figure 6. Photo of Collaboration with Village Cooperative Here

Discussion

The implementation of the educational program on processed snack food production from local ingredients demonstrated progressive transformation from technical skill enhancement towards social restructuring within the community. At the initial stage of engagement, most participants perceived home-based economic activities as supplementary income sources and tended to adopt a subsistence mindset (World Bank, 2023). This aligns with observations by Armendáriz and Morduch (2010), who state that rural microentrepreneurs often lack confidence in expanding business activities due to limited knowledge, resource constraints, and absence of

structured guidance (Armendáriz & Morduch, 2010). The gradual shift in attitudes that emerged during the mentoring phase confirmed the importance of applying community-based organizing approaches and participatory learning strategies (Afandi et al., 2022).

The technical workshops enabled participants to demonstrate *direct transformation of raw agricultural ingredients into marketable snack products*, which confirms the theory of value addition (Rahmawati & Nurhayati, 2023). Consistent with Kolb's (1984) experiential learning cycle, participants performed better after being actively involved in hands-on production, reflection, and peer discussions during group simulation. The progression from basic cooking to conceptualizing product profit margins and packaging indicates effective integration of theory and practice. These findings reinforce Kotler and Keller's (2016) perspective that entrepreneurial innovation emerges when users experiment with real scenarios supported by structured business insights (Kotler & Keller, 2016).

One significant transformation observed was the emergence of collective institutional structure, evidenced through the establishment of *Kelompok Usaha Snack Desa*. This change reflects UNDP's (2021) community empowerment model, suggesting that local institutions develop organically when participants are encouraged to cooperatively solve economic challenges (UNDP, 2021). The presence of informal leadership, where individuals voluntarily facilitated quality improvement and financial planning, confirmed the theoretical framework of local leadership development (Lussier & Achua, n.d.). Such leadership emergence correlates with findings by Yusrizal et al. (2024), who reported similar behavioral advancement during SME empowerment projects in Aceh, where active contributors gradually assumed facilitator roles in group dynamics (Yusrizal et al., 2024).

The mentoring sessions were also critical in reducing participants' psychological barriers toward financial planning. Prior to program implementation, most participants relied on rudimentary pricing methods without structured cost calculations. Post-intervention behavioral change indicated increased financial self-awareness, demonstrating what Lusardi and Messy (2023) describe as *financial self-efficacy*, which is a crucial determinant of long-term entrepreneurial sustainability ('Lusardi & 'Messy, 2023). The results also align with Demirgüç-Kunt, Klapper, and Singer's (2018) findings that small-scale financial education linked to practical application yields higher retention rates and adoption than theoretical-based interventions (Demirgüç-Kunt et al., 2018).

The integration of local youth within the program enriched social dynamics and contributed to technological acceptance, particularly in digital marketing

adoption. This supports Loo's (2025) perspective that intergenerational collaboration accelerates digital entrepreneurship readiness in rural settings (Loo, 2025). Youth involvement bridged technological gaps among older participants and encouraged the use of mobile-based promotional strategies such as WhatsApp Business and social platforms, reflecting the concept of digital inclusion in microenterprise development (Bank Indonesia, 2023b).

From a social transformation standpoint, the project demonstrated increasing household decision-making autonomy among women participants. Initial assessments indicated financial dependency on other household members; however, after program implementation, most participants took initiative in business planning. This transformation validates the empowerment theory proposed by Kabeer (1999), which states that economic proficiency contributes to improved authority in household decision processes (Kabeer, 1999). Furthermore, it supports ILO's (2022) argument that improving women's ability to generate income increases their socioeconomic standing and promotes intra-household participatory decisions (ILO, 2022).

Comparatively, earlier studies in rural Malaysia and Thailand indicated similar outcomes when programs combined technical training with entrepreneurial mentoring (Rahman et al., 2023). The result of this program thus confirms that integrated and participatory community-based strategies yield higher sustainability than fragmented training models. The emergence of local leaders, institution-based community businesses, and increased participation in financial decision-making represent indicators of successful social transformation, as proposed in community development frameworks (Chaskin, 2000).

The findings demonstrate that community empowerment programs combining technical education, participatory mentoring, and collective organizing yield significant social impact beyond economic skill improvement. The coherent transformation from individual participation toward institutionalized economic cooperation illustrates long-term sustainability potential. The observed behavioral shift, emergence of leadership figures, and establishment of community-based snack enterprise groups reflect meaningful social restructuring aligned with empowerment and transformation theory. This supports the recommendation that future programs must prioritize *holistic empowerment models* integrating technical skill-building, entrepreneurial theory, and ongoing peer-based mentoring to maintain program impact.

Conclusion

The implementation of community education on processed snack food production using locally sourced ingredients has shown that structured and participatory learning approaches can significantly enhance not only technical skills but also social awareness and economic orientation. The shift from subsistence-based income strategies toward entrepreneurial development demonstrates that rural communities possess strong adaptive potential when provided with contextually relevant guidance and mentoring.

From a theoretical standpoint, the program validated *experiential learning theory* (Kolb, 1984), where hands-on involvement and reflective practice accelerated knowledge retention and practical application. Likewise, the success of participatory engagement supports the principles of *Participatory Action Research (PAR)*, which posit that active involvement of communities leads to increased ownership of economic transformation (Heron & Reason, 2013). The observed behavioral change—particularly among female participants—in adapting business strategies affirms empowerment theory (Kabeer, 1999), where access to economic capability stimulates increased decision-making authority. Furthermore, the emergence of *Kelompok Usaha Snack Desa* reflects the operationalization of *community-based economic institution formation* as proposed in the UNDP (2021) model for sustainable empowerment practices.

In essence, the program's outcomes demonstrate that community-driven initiatives combining practical production, financial education, and continuous supervisory mentoring produce a multidimensional impact: (1) enhanced individual technical skill, (2) emergence of collaborative business mechanisms, (3) strengthened financial self-awareness, and (4) evolving local leadership that supports entrepreneurial continuity. These achievements reinforce the argument that development interventions in rural communities must be integrated rather than fragmented, human-centered rather than instruction-based, and collaborative rather than top-down.

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