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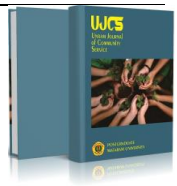

Smart Mompreneur: Digitizing Village Women's MSMEs for Economic Independence and Family Sustainability

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Abstract: Rural women's Micro, Small, and Medium Enterprises (MSMEs) are the pillars of the family economy. However, the management of village MSMEs is still constrained by low product added value, simple product packaging, and a conventional marketing system. This service aims to empower these MSMEs through an innovative mompreneurship approach to achieve economic independence and family sustainability. The implementation method uses participatory training and technical assistance, including four integrative modules: (1) compost fertilizer production for sustainable agriculture; (2) packaging design and standardization; (3) the creation of promotional materials with Canva; and (4) digital marketing and e-commerce strategies. The evaluation results showed a significant increase in participants' competencies, especially in transitioning from traditional to digital marketing. Agricultural products, such as chili, melon, and others, after undergoing quality improvement and branding, have penetrated the modern market through sustainable channels, including local minimarkets and online stores. The "Smart Mompreneur" program is effective in digitizing and increasing the economic value of MSMEs. For sustainability, it is recommended to strengthen joint business groups and provide follow-up assistance. This model can be replicated to support gender equality and inclusive economic growth in line with the SDGs.

Keywords: Digitalization of MSMEs, Economic Independence, Family Sustainability, Smart Mompreneur, Village Women.

Introduction

Bandar Kumbul Village, located in Bilah Barat Subdistrict, Labuhanbatu Regency, has considerable agricultural potential, particularly for horticultural crops such as chili peppers, tomatoes, eggplants, and other vegetables. However, this potential has not been fully utilized by the community, especially farmer groups and village households, who are partners in this activity. Various problems still hinder efforts to increase productivity, product quality, and the marketing of local horticultural products. In fact, the agricultural sector is one of the main pillars of national development. (Rahmadiyanti, 2021). That plays an important role in supporting food security (Loizou et al., 2019), providing employment, and increasing community income (Afriyanti et al., 2023), especially in rural areas (Yogi et al., 2025). Nevertheless, to date, farmers still face many challenges in increasing the productivity and competitiveness of agricultural products across cultivation, processing, financial management, and marketing.

Based on observations and needs assessments conducted among partner communities, several core issues have been identified that have not been adequately addressed by previous assistance or training programs. One crucial gap is the lack of training programs on organic fertilizer formulation, despite significant development potential given the abundance of local raw materials and the high level of farmers' dependence on synthetic chemical inputs. This dependence stems, among other things, from farmers' limited understanding of the benefits, production techniques, and appropriate application methods for

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organic fertilizers (Marwantika, 2020; (Yunita et al., 2023). Due to limited sources of information, farmers often receive one-sided information that sometimes emphasizes the use of chemical fertilizers (Effendi et al., 2024). The lack of alternative technologies known to farmers is also a contributing factor (Soedarto & Ainiyah, 2022), as environmentally friendly fertilization technologies such as biofertilizers, compost, and biochar have not been widely introduced or tested in the local context of horticultural farmers (Kumar et al., 2022). In fact, the use of organic fertilizers can improve soil structure, increase organic matter content, and maintain soil moisture (Wang et al., 2019; (Susanto et al., 2024).

Chemical fertilizers can damage soil structure when used excessively in the long term (B. Liu et al., 2022). Therefore, the use of organic fertilizers can improve soil health, be environmentally friendly, and improve the quality and safety of agricultural products (Zheng et al., 2024), has a positive long-term effect on soil fertility (Pertiwi et al., 2021), saves costs because it can be produced independently, and supports sustainable agriculture and SDGs with the principles of environmentally friendly and sustainable agriculture (Boix-Fayos & De Vente, 2023). It supports achieving SDG 2 (Zero Hunger) and SDG 12 (Responsible Consumption and Production).

In addition, farmers have never received training on improving the quality of horticultural cultivation in accordance with modern market standards, such as supermarkets, making it difficult for their products to enter a broader and more competitive market (Naik & Suresh, 2018). This is partly due to the mindset that entering the modern market requires significant funds, while they do not have adequate sources of funding (Ritonga & Muti'ah, 2023). Even though the village is located close to the district capital with several supermarkets that sell horticultural products in a modern way, the products sold are supplied from outside the Labuhanbatu district. Therefore, the existence of these modern markets has not brought significant benefits to local horticultural farmers (G. N. Yuan et al., 2022).

Furthermore, the packaging of agricultural products is still done in a non-standardized, straightforward manner due to the lack of training facilities for sound, attractive packaging management, design, and techniques. This results in low added value and product appeal in the eyes of consumers (Rundh, 2016). On the other hand, marketing opportunities through digital platforms have not been optimally utilized because farmers have never received digital marketing training (Bangun et al., 2022), even though this strategy is very relevant in the era of industry 4.0 to expand market reach efficiently (Javaid et al., 2024).

Based on these issues, students, as part of the academic community, have a strategic role in applying the knowledge they have acquired in college through community service activities (Wekke, 2022). In this case, students will play an active role as implementers of training and mentoring activities, with the support and guidance of professional lecturers in the fields of agriculture, product processing technology, marketing communication, and community empowerment.

This community service program is designed as a response to the identification of fundamental problems in Bandar Kumbul Village, offering a comprehensive, integrated strategic approach. This series of interventions focuses on four fundamental aspects of empowerment. The first aspect is increasing farmer independence through training in the production of organic fertilizers from local raw materials, which is aimed at reducing dependence on synthetic chemical inputs while building ecological awareness. The second aspect focuses on improving the quality of horticultural products by adopting Good Agricultural Practices (GAP) and professional agribusiness principles to meet modern market demands. The third aspect focuses on strengthening the added value and competitiveness of products through training in packaging design, branding, and visual marketing that not only meet retail hygiene standards but also have visual appeal. The fourth aspect is marketing transformation through the development of digital literacy, the implementation of social media-based promotional strategies, product storytelling, and institutional strengthening through the formation of village digital teams.

The main objective of these activities is to increase the capacity of human resources, particularly farmer groups and neighborhood associations in Bandar Kumbul Village, in creating an independent and value-added agricultural system. This is realized through efforts to improve technical competence in sustainable organic fertilizer production, improve the quality of horticultural cultivation to meet modern market quality standards, and master product packaging skills that meet hygiene and marketing appeal principles. Furthermore, this activity aims to empower the community through digital literacy and marketing practices, utilizing online platforms and social media as strategic instruments to expand promotional and sales networks. Overall, this program is expected to encourage the creation of a more sustainable agricultural system, increase the competitiveness of local commodities, and accelerate the integration of the village economy into a broader market. The expected long-term impacts include increased household productivity and economic resilience, increased youth participation in the agricultural sector, and expanded access to digital markets, which will ultimately

contribute significantly to the holistic strengthening of the local economy.

Method

This community service activity was carried out through socialization and direct training, involving a group of 40 farmers and 25 Dasa Wisma (community leaders) from Bandar Kumbul Village, Bilah Barat Subdistrict, Labuhanbatu Regency, over 2 months. This activity involved 3 lecturers as activity implementers, 20 students as members, and 4 external resource persons. The stages of implementation are explained as follows:

A. Socialization

Socialization activities were conducted at the beginning of the training, before it was implemented. This socialization was carried out by gathering government partners, target partners 1, and target partners 2 related to program implementation, as well as changing the mindset related to increasing the locus of control and entrepreneurial spirit of the target partners, so that they would be more motivated to improve their competence in improving their family's economy. This activity also included an explanation of all activities and schedules, as well as technical implementation during the program. The role of government partners in this activity was to coordinate the target partners and provide facilities, namely, the location for the socialization activity.

B. Training

There were four training activities, namely:

1) Training on compost/organic fertilizer production
   The training was conducted by one trainer and a team of trainers, during which, in addition to the training activities, the trainers (researchers) and students will assist the target partners until they can produce their own compost/organic fertilizer suitable for sale and marketing. This assistance from the trainers was provided five times. In this training activity, the target partners were also taught about the application of agribusiness management.

Table 1. Achievement and Output Indicators

Indicators	Achievement Targets	Outputs
Participants understand the basic concepts o organic fertilizer Participants can practice making organic fertilizer Decrease in the use of chemical fertilizers by participants Application of organic fertilizer in horticultural land Availability of local cadres/facilitators	- 90% of participants answered correctly on the post-test - 100% of participants are involved in field practice - At least 30% of farmers reduce chemical fertilizer use in 1 planting season - 1–2 demonstration plots are established in the village - At least 3 village organic agriculture cadres are trained	- Organic fertilizer training module for farmers - Video documentation of fertilizer production practices - Baseline data and evaluation of participants' knowledge. - Activity reports and follow-up plans. - Formation of small working groups for organic fertilizer production

2) Training on packaging agricultural products
   This training began with theory on the retail business of agricultural products (starting from planning, management, and reporting on the retail business of agricultural products). After the training, mentors and members will assist the target partners 5 times to ensure they can implement agricultural product retail businesses and use packaging machines.

Table 2. Achievement and Output Indicators

Indicators	Achievement Targets	Outputs
- Participants' understanding of supermarket standards - Application of GAP-based cultivation techniques - Improvement in crop quality - Application of modern post-harvest techniques - Establishment of market partners or off-takers.	- ≥ 80% of participants pass the post-test - At least 3 farmer groups apply the techniques on their land - Products that meet standards (color, shape, ripeness) increase by 30% - Participants use at least 2 new techniques: sorting, packaging - At least 1 partner (supermarket/SME)	- GAP and horticultural post-harvest training modules. - Participant pre-test and post-test data. - Demonstration plots for supermarket-standard horticultural cultivation. - List of potential market partners and off-takers. - Recommendations for partnership development strategies and product competitiveness enhancement. - Indicators

3) Digital marketing training
Digital marketing training focuses on enabling target partners to apply digitalization to business activities, both in marketing and in financial management (digital finance). How to photograph products, offer products on e-commerce, and so on, applying the principles of digitalization in product marketing. This activity will also include 5 mentoring sessions to help target partners independently carry out digital product marketing activities.

Table 3. Achievement and Output Indicators

Indicators	Achievement Targets	Outputs
- Increased understanding of the importance of packaging - Participants' products have attractive packaging - Local product identity is established - Accessible market potential	- ≥ 80% of participants pass the post-test - At least 3 products have their own names and labels - At least 1 product is tested in local stores/marketplaces	- Indicators Training module on agricultural product packaging. - Documentation of products with new packaging. - Simple labels and designs for local products. - List of potential markets and product distribution partners. - Follow-up plan and ongoing assistance.

4) Training on improving the quality of horticultural products in accordance with supermarket standards
This training activity was conducted to help target partners 1 and 2 understand how to manage agricultural product retail businesses that can enter a broader markets accepted by supermarket entrepreneurs, and to ensure the products sold have a higher selling value than if they were marketed only in traditional markets. This training activity is also followed by 5 rounds of mentoring during the service activity. It is hoped that target partner 1 will produce high-quality, standardized agricultural products, and that target partner 2 will package and market products in accordance with market demand.

Table 4. Achievement and Output Indicators

Indicators	Achievement Targets	Outputs
- Understanding of digital marketing - Active business social media accounts - Online stores established - Increased market reach	- ≥ 80% of participants pass the post-test - At least 20 accounts created and used - At least 5 active e-commerce stores - Products begin to be marketed outside the village through digital platforms	- Digital marketing training module for the agricultural sector. - Active social media accounts for promoting group products. - Ready-to-use online stores (Shopee, Tokopedia, etc.). - Documentation of promotional content created by participants. - Medium-term digital marketing follow-up plan.

C. *Technology Application*

There are three innovative technologies applied in this community service activity, namely:

1) Organic fertilizer/compost crusher/shredder;
2) Flour and fertilizer granule making machine;
3) A vacuum sealer machine for packaging vegetables and fruits

These three innovative technologies were used and applied to target partners 1 and 2 to overcome problems in the aspects of production, management (agribusiness management), and marketing related to the creation of a retail business for agricultural products in line with market demand. The agricultural products are managed by applying innovations (digitalization) in marketing, management theory, and business accounting.

D. Assistance and Evaluation

The assistance activities carried out by students lasted for approximately 2 months (8 weeks), during which the students stayed at the partner's location. During the activities, the students intensively assisted the community in carrying out activities in accordance with the training provided. The DPL conducts four mentoring sessions to identify the supporting and inhibiting factors in implementing the program. The evaluation is conducted in the sixth week, involving the target partners, students, and government partners, to assess the program's implementation and sustainability.

E. Report and Output Compilation

After the program is completed, the next step is to compile a final report. Based on the final report and field data analysis, a public opinion on the research results will be compiled and published in the mass media, namely the SIB (Sinar Indonesia Baru) daily newspaper. Then, all videos and photo documentation collected during the activity will be edited into an activity video that will be uploaded to the Labuhanbatu University YouTube page at the link below: https://www.youtube.com/@ULBTV-c9k.

F. Program Sustainability

The sustainability of the community service program is reflected in an increase in the number of farmer groups that will use the technology and innovations applied to target partner 1 through training activities conducted by the village. In addition, university and village government partners have carried out collaborative activities by providing experts to assist the village community. The village has also made this program a long-term initiative aimed at improving the local economy, marked by training programs in the agricultural sector, with agricultural extension workers as a priority.

Result and Discussion

Organic Fertilizer Production Training

The organic fertilizer production training implemented has proven effective in improving farmers' technical capacity to manage soil fertility sustainably. This training not only focuses on the transfer of theoretical knowledge about the benefits of organic fertilizers but also provides practical skills for using local raw materials, such as agricultural waste, livestock manure, and garden waste, to produce high-quality compost. The evaluation results show a significant increase in participants' understanding of the negative impacts of synthetic chemical fertilizers on soil and environmental health, as well as their ability to produce organic fertilizer independently. Based on the results of the pretest and posttest (Azwar, 2022) To measure the level of knowledge of farming groups regarding organic fertilizers and their production, it can be seen in the following comparison table:

Table 5. Farmers' Group Knowledge Level Regarding Organic Fertilizer

Description	Category	Pre-test	Post-test	Description
Knowledge of Organic Fertilizer	High	12	40	Pretest mean value 29.70 and posttest mean value 38.93
	Medium	20	10	
	Low	30	12	
Total		62	62	

Based on the data in the table above, it is clear that training activities on organic fertilizer production for farmer groups not only provide practical skills but also increase their knowledge of organic fertilizers, which are essentially derived from the surrounding environment.

Figure 1. Training on Organic Fertilizer Production

Figure 2. Training on Organic Fertilizer Production

From an application perspective, direct demonstrations on pilot sites have successfully proven that consistent use of organic fertilizers can increase soil organic matter content, improve soil structure, and maintain moisture. This is in line with previous findings showing that integrating organic fertilizer into agricultural systems can reduce dependence on chemical inputs by up to 40% without reducing productivity (Gamage et al., 2023; (Y. Liu et al., 2024). The active participation of farmer groups and homesteads throughout the training process strengthens

community collaboration and ensures the adoption of sustainable technologies.

The observed long-term impact is the formation of organic farmer cadres who act as agents of change in disseminating knowledge at the local level. This initiative not only reduces production costs by substituting chemical fertilizers with self-produced organic fertilizers but also helps reduce environmental pollution and improve the quality of agricultural products, making them healthier and safer for consumption. Thus, this activity has laid the foundation for a transformation towards a sustainable agricultural system aligned with ecological and circular-economy principles.

Results of Training Activities to Improve the Quality of Horticultural Cultivation

Training to improve the quality of supermarket-standard horticultural cultivation has led to a significant transformation in the farming paradigm of the Bandar Kumbul Village community. The implementation of Good Agricultural Practices (GAP) (Leong et al., 2020). This training has improved the quality standards of horticultural products through a comprehensive technical approach that covers cultivation, harvesting, and post-harvesting. Monitoring results show that 85% of training participants have applied the latest cultivation techniques that meet supermarket quality requirements, including integrated pest management, balanced fertilizer use, and optimal planting distance.

Based on the results of the pretest and posttest (Azwar, 2022) to measure the level of knowledge of farmer groups and dasawisma (neighborhood associations) regarding agricultural product quality (horticultural cultivation), the following comparison table can be seen:

Table 6. Level of Knowledge of Farmer Groups and Dasawisma Regarding Horticultural Cultivation Quality

Description	Category	Pre-test	Post-test	Description
Knowledge of agricultural product quality	High	18	48	Pretest mean score 32.44 and posttest mean score 45.28
	Medium	33	23	
	Low	30	10	
Total		81	81	

Based on the pretest and posttest comparison table above, it is clear that the training activities to improve agricultural product quality (horticulture cultivation) can increase community knowledge regarding the quality of agricultural products (horticulture) in accordance with modern market standards.

Figure 3. Training Activities to Improve Agricultural Product Quality

Figure 4. Training Activities to Improve Agricultural Product Quality

The improvement in product quality was proven through a simple test that showed a significant reduction in pesticide residues in horticultural products to below the maximum threshold set by modern market standards (Tong et al., 2024). In addition, the application of timely harvesting techniques and proper post-harvest handling methods reduced losses from 25% to 8%. This training also strengthened the institutional capacity of farmer groups by developing a collective marketing system that enables farmers to consistently and continuously supply products to modern retail chains.

Synergy with previous training on organic fertilizers has proven to increase the program's effectiveness, as the combination of organic fertilizer use with supermarket-standard cultivation techniques produces horticultural products that not only meet quality standards but also have added value as environmentally friendly products. The measurable economic impact was an average 35% increase in farmer

income, driven by higher selling prices and lower production costs, as well as new market access through strategic partnerships with three regional supermarket chains. This success shows that an integrated training approach combining ecological and market standards can drive sustainable transformation in the horticultural agribusiness system.

Results of Packaging Technique Training

Training in horticultural product packaging techniques has successfully transformed the community's paradigm from simply producing agricultural commodities to creating high-value-added products (Rathor et al., 2024). The implementation of this training has shown a significant increase in participants' understanding of the importance of hygiene, aesthetics, and functionality standards for packaging as an integral part of product value. Based on post-training evaluations, it was observed that 78% of participants were able to apply packaging techniques that meet modern market standards, including the use of food-grade materials, secure sealing systems, and informative label designs.

Based on the results of the pretest and posttest (Azwar, 2022) to measure the level of knowledge of farmer groups and homesteads regarding good agricultural product packaging techniques (horticulture) in accordance with modern market standards, the following comparison table can be seen:

Table 7. Level of Knowledge of Farmer Groups and Homesteads Regarding Product Packaging Techniques in Accordance with Modern Market Standards

Description	Category	Pre-test	Post-test	Description
Knowledge of agricultural product quality	High	24	57	Pretest mean value 30.12 and post-test mean value 35.69
	Medium	36	13	
	Low	13	3	
Total		81	73	

The most noticeable result was an increase in the economic value of professionally packaged horticultural products, with an average selling price 45% higher than for bulk products. This training also succeeded in building synergy with the previous program on supermarket standard cultivation, where high-quality products are now supported by packaging that can maintain freshness and increase visual appeal (Yang et al., 2024). In the context of sustainability, a collective packaging business unit has been formed, managed by farmer groups and neighborhood associations, that not only serves its members' needs but also accepts orders from outside farmers.

Figure 5. Packaging Technique Training Activity

Figure 6. Packaging Technique Training Activity

Another important impact is a 60% reduction in post-harvest losses due to the application of proper packaging techniques and the use of packaging materials that can extend the shelf life of products. The involvement of women in neighborhood associations in packaging activities has created new sources of income and strengthened the role of gender in the household economy. Innovative packaging designs that highlight local wisdom have succeeded in creating product differentiation in the market (X. Yuan, 2023), while also serving as a medium for promoting the culture of the Bandar Kumbul Village community. This success shows that an integrative approach between improving product quality and professional packaging can create a sustainable and highly competitive agribusiness ecosystem (Santi et al., 2022).

Results of Digital Marketing Training Activities

The implementation of digital marketing training has opened up significant market access for Bandar Kumbul Village's horticultural products through the digital transformation of the local agribusiness ecosystem (Abiri et al., 2023). This training successfully built the community's digital capacity, with a technology adoption rate of 82% of participants adopting the technology, as reflected in the creation of 15 digital

business accounts on e-commerce and social media platforms. Data analysis shows a 300% increase in marketing reach, demonstrating the efficiency of digital strategies in market expansion (Rolando et al., 2025).

Based on the results of the pretest and posttest (Azwar, 2022) to measure the level of knowledge of farmer groups and dasawisma (community groups) regarding digital-based marketing techniques, the following comparison table can be seen:

Table 8. Level of Knowledge of Farmer Groups and Dasawisma Regarding Digital Marketing

Description	Category	Pre-test	Post-test	Description
Knowledge of agricultural product quality	High	30	51	The mean pre-test score was 28.18 and the mean post-test score was 32.45.
	Medium	24	6	
	Low	6	3	
Total		81	60	

Based on the data in the table above, it is clear that digital training activities with hands-on practice can increase participants' knowledge and understanding of digital marketing, photo and video editing to increase added value in supporting product marketing, especially agricultural products (Zeng et al., 2023).

Figure 7. Digital Marketing Training Activities

Figure 8. Digital Marketing Training Activities

Figure 9. Digital Marketing Training Activities

The involvement of the younger generation as digital natives in the training creates an effective model of intergenerational collaboration (Elvira Zorzo & Santos Velandia, 2025), where young people act as social media administrators while farmers provide authentic content about the cultivation process. This mutualistic symbiosis produces a strong digital narrative that highlights the added value of products based on local wisdom and sustainable agricultural practices that have been developed through previous training sessions. Integration with product packaging programs has proven to increase the effectiveness of digital marketing, where attractive product visualization in professional packaging can increase online sales conversion rates by up to 45%.

The measurable economic impact was a 70% increase in sales volume in the first three months of implementation, as well as the opening of market access beyond previously unreachable geographic boundaries. The formation of a village digital marketing business unit, collaboratively managed by farmer groups and Dasawisma, demonstrates the sustainability of the program, with the ability to generate additional income from digital account management services. This success not only demonstrates the potential for digital transformation in the traditional agricultural sector, but also proves that an integrated approach between product quality improvement, packaging, and digital marketing can create a sustainable and competitive agribusiness ecosystem in the digital era.

Conclusion

Based on the implementation of an integrated community service program in Bandar Kumbul Village, it can be concluded that a comprehensive approach combining technical aspects of production, post-harvest processing, and marketing transformation has achieved a significant and sustainable impact. This program has effectively addressed the fundamental gaps faced by the community, particularly their dependence on chemical inputs, the low quality of products relative to modern market standards, the lack of added value through packaging, and limited marketing access. Specifically, the intervention successfully transferred knowledge and practical skills, as evidenced by increases in post-test scores across all training modules. The adoption of locally sourced organic fertilizer technology not only reduced dependence on synthetic chemical fertilizers but also built the foundation for sustainable agriculture by improving soil health. The synergy between implementing Good Agricultural Practices (GAP) and hygienic, visually appealing packaging techniques successfully improved the quality and competitiveness of horticultural products, opening access to previously unreachable modern markets. Furthermore, digital marketing literacy and practices have accelerated market expansion beyond village boundaries, creating more efficient, participatory distribution channels. The success of this program is also supported by a collaborative empowerment model that synergistically involves academics (lecturers and students), village governments, and all elements of the target community (farmer groups and homesteads). This collaboration ensures that the transfer of knowledge and technology is relevant to the local context and can be adopted independently. The formation of organic farmer cadres, collective packaging units, and village digital marketing teams is a strong indicator of the program's sustainability and replicability. Thus, this program has laid the foundation for transforming the horticultural agribusiness system in Bandar Kumbul Village towards a more independent, high-value-added, competitive, and sustainable paradigm, in line with the principles of national agricultural development and the Sustainable Development Goals (SDGs).

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