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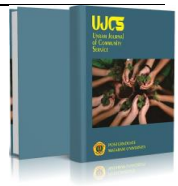

Promoting Economic Independence Economic Independence through Digital Technology and Operational Management for Improved Product Competitiveness

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Abstract: This community service program aims to increase the capacity and sustainability of Cilembu yam MSME players in Cilembu Village through structured training and mentoring. Activities began with six initial meetings involving 30 participants, mostly women aged 56-80 years old with basic education backgrounds. The training focused on digital technology and operational management, as well as new product development. Evaluation showed that the training successfully increased the use of digital technology from 72.26% to 85%, with a significant increase in the adoption of e-commerce platforms. Participation from younger age groups also increased from 13% to 20%, demonstrating the program's success in attracting the younger generation. Challenges related to productivity and marketing decreased, with productivity issues falling from 61.51% to 40% and marketing issues from 54.19% to 35%. The effectiveness of the training increased, with 90% of participants able to apply the training materials in their businesses. Support and communication from the implementation team was also rated as excellent, with responsiveness increasing to 95%. In conclusion, the program had a significant positive impact, but there are still challenges that need to be addressed in terms of productivity and marketing. It is recommended to focus on e-commerce technology capacity building, capital development, and product innovation, as well as strengthening ongoing mentoring to ensure the sustainability and development of MSMEs in the future.

Keywords: Mentoring; Product innovation; Sustainability; Business application; Capacity building.

Introduction

Sumedang Regency is known for its local food wealth, especially Cilembu yam, which has been an important part of the agricultural tradition in Cilembu Village since the 1960s or 1970s. Cilembu yam is not just an ordinary crop, but has great potential to be developed into a superior food commodity with significant economic value. Support from the Ministry of Agriculture (MOA) and various related parties underlines the importance of Cilembu yam in facing global challenges, including in the triple export program being promoted by the government (Ministry of Agriculture, 2022). In addition, Cilembu yam is also recognized as having health benefits, making it a strategic opportunity for further development.

Cilembu yam development focuses not only on increasing production and productivity, but also on processing to downstream to meet market quality standards, both local and national. Innovation efforts in processing Cilembu yam into a variety of attractive food

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products are also being carried out to increase product competitiveness and added value. One concrete example of utilizing the potential of Cilembu yam is a household industry in Cilembu Village, known as "Ma Utik." Ma Utik has succeeded in increasing the selling value of Cilembu yam by processing it into value-added products, such as yam donuts and yam chips, roll eggs, puddings that not only improve the family economy but also empower women in Cilembu Village under the guidance of P4S Putri Kareumbi (P4S Putri Kareumbi, 2019).

The initiative taken by P4S Putri Kareumbi, which was established in 2018 and fostered by the Ministry of Agriculture and BBPP Lembang, is also evidence of success in utilizing yard land through the Sustainable Food Home Area (KRPL) program. P4S Putri Kareumbi has successfully developed various non-rice and non-wheat food preparations based on Cilembu sweet potatoes, such as sweet potato chips, sweet potato cakes, sweet potato dodol, and others. In addition, P4S Putri Kareumbi also plays an active role as an internship site for students and students from various universities, strengthening its role as an education and training center based on Cilembu yam development (Ma Utik, 2020).

The problems faced by the home industry "Ma Utik" in Cilembu Village are the main focus of this community service activity. As one of the business actors that utilizes the potential of Cilembu sweet potatoes, Ma Utik faces various challenges that can hinder the development of its business. Some of the main problems faced include limited production capacity. Although market demand continues to increase, Ma Utik has difficulty in fulfilling it due to limited production capacity and quality improvement in accordance with consumer taste image desires. This is a major obstacle that, if not resolved immediately, can reduce the potential for business growth and the competitiveness of participants' products in the market (Roswinna et al. 2024).

In addition, product quality stability is also a problem that needs special attention. Difficulties in maintaining consistent product quality are often caused by changes in the production process or inconsistent raw materials, which ultimately impacts the reputation of the Ma Utik brand in the eyes of consumers. This condition results in fluctuations in product quality that can reduce consumer confidence in the products produced (Marina et al., 2024).

The efficiency of the production process is also a problem. Slow and inefficient production processes result in low productivity and reduce business profits. Efforts are needed to improve efficiency by applying the right technology and more effective operational management so that product competitiveness can be improved (Marina, et al., 2024).

In addition to production and quality issues, inefficient financial management is also an obstacle that needs to be overcome (Marina et al. 2023). The lack of control over production costs and the lack of careful financial planning make it difficult for Ma Utik to maintain business continuity and make investments for further development. Therefore, improvements in financial management, including more controlled spending and more careful planning, are important solutions to maintain Ma Utik's business continuity and development.

In an effort to overcome these problems, this service activity aims to assist Ma Utik in improving the competitiveness of its business through the implementation of good operational management. The proposed solutions include increasing production capacity, improving product quality control, increasing production process efficiency, and improving financial management. With this structured approach, it is expected that Ma Utik can overcome the existing challenges and be able to increase production capacity and competitiveness of participants' products in local and national markets. The problem-solving solution framework is depicted in Figure 1.

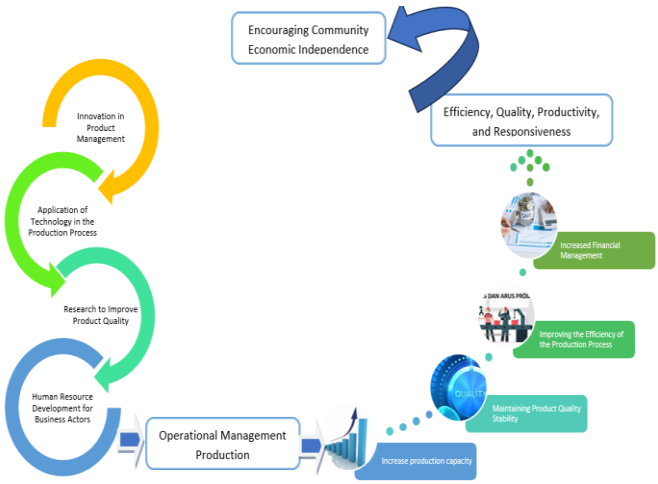

Figure 1. Overview Of Science And Technology In Promoting Community Economic Independence

Method

The method of activity in the community service program is carried out through several stages as shown in Table 1.

Table 1. Community Service Implementation Methods in Encouraging Community Economic Independence

Methods	Destination	Description	Activity Stages
Training and Empowerment	Equipping businesses with new skills in operational management and agricultural technology.	Intensive training involving theory and practical sessions with support from experts and resource persons	1. Theoretical sessions on operational management and agricultural technology. 2. Practical sessions on technology use. 3. Questions and answers and discussions.
Collaboration and Support	Optimise programme implementation through support from universities and related institutions.	Collaboration between Universitas Majalengka and BIMA, and grant support from KEMENDIKBUD.	1.Programming and responsibilities. 2. Provision of funds and logistics. 3. Evaluation of programme implementation.
Mentoring and Evaluation	Provide ongoing support and assess the impact of activities.	Technical assistance as well as periodic evaluations to ensure success and provide feedback.	1. On-site mentoring. 2. Monitoring and feedback. 3. Data collection and analysis. 4. Preparation of evaluation report.
Stimulus and Product Development	Improve participants' creativity and production capabilities through new product development.	Stimulus to develop new products and marketing of products.	1. Division of participants into groups. 2. Development and production of new products. 3. Product marketing.

Result and Discussion

Technology

The first phase of this activity, the technology needs inventory, was attended by 30 participants. The inventory aimed to assess the equipment and software required by Ma Utik. Based on the results of the inventory, the required equipment includes cutting, peeling, and grinding machines, which are suitable for Ma Utik's business production scale.

The next activity is the application of technology, which includes the installation and use of the equipment. Work that requires physical labour, such as operating the cutting and peeling machines, is done by male participants. This was adapted to the greater labour requirement for such tasks. In addition, operational management applications were introduced to help optimise production processes and measure efficiency. The use of this software was focused on participants who were young and productive, with the hope that they could utilise the technology to increase the productivity of their businesses.

The results of this activity showed an increase in participants' understanding of the use of technology in their business operations. Male participants took an active role in the installation and use of physical equipment, while younger participants showed interest and ability in operating operational management software. The programme is expected to improve the production efficiency and competitiveness of Ma Utik products in the local market.

Figure 2. Results of Technology Use and Operational Management Application Training

Training and Empowerment

In the Training and Empowerment phase, entrepreneurs are provided with new skills through a series of intensive trainings that aim to improve their knowledge and skills in the areas of financial management, operational management, and agricultural technology.

The training activities started with an initial scoping session on 27 June 2024, where businesses were introduced to the training programme and an initial assessment of their training needs was conducted. This session provided participants with an overview of the objectives and benefits of the training.

On 15 August 2024, a more in-depth theoretical and practical session was conducted. This session involved various experts and resource persons, including:

a) Dr Ir. Dety Sukmawati, M.P., who provided material on agricultural technology and how technology can be integrated into agricultural business operations.
b) Maria Lusiama Yulianti, S.E., MM, who explained about financial management, including cash flow management and financial planning for small businesses.
c) Dr Ida Marina, M.P. and Adi Oksifa Rahma Harti, who focused on introducing operational

management practices that can improve production efficiency.

d) Dr Ir. Hj Euis Dasipah, M.P., who also made important contributions to the discussion on product development and marketing strategies.

The training was designed to provide a balance between theory and practice, with the aim that participants would not only be able to analyse the theory and practice, but would also be able to utilise it to improve their business performance.

Figure 3. Training and Empowerment

The Q&A session during the training was guided by Dr Ir. Elly Roosmaria, M.Si. and Agi Dahtiar, S.Pd., M.Pd., M.P., who allowed participants to explore the material further and ask questions about specific problems they faced. With this interactive approach, participants had the opportunity to directly practice the material presented, thus improving their understanding and skills in running their businesses more effectively and efficiently. The results of this Training and Empowerment phase showed an increase in participants' skills, especially in the aspects of financial and operational management, as well as the application of modern agricultural technology.

Collaboration and Support

At the Collaboration and Support stage, close cooperation was built between various parties, including Majalengka University, Winaya Mukti University, agricultural extension workers, and the Cilembu Village government. This collaboration is fully supported by the BIMA grant under the Ministry of Education and Culture (KEMENDIKBUD). This collaboration aims to ensure that every aspect of the programme can run effectively and provide maximum benefits to the local community.

a) Institutional Cooperation.

Majalengka University and Winaya Mukti University took an active role in the implementation of this programme. Teams from both universities worked together to provide the necessary expertise and resources for training and mentoring local businesses. Local agricultural extension officers and the village government also served as key liaisons between the programme and the local community, ensuring that community needs were integrated into programme implementation.

b) Resources and Funding

The BIMA grant from KEMENDIKBUD provides much-needed financial support to run the various programme activities, from training to procurement of equipment and technology required by the enterprises. The grant also allows for ongoing evaluation, which aims to ensure that programme implementation is on track and delivering real impact.

c) Implementation of activities

Implementation is conducted periodically by a joint team of university and agricultural extension officers to monitor the progress of the programme and assess the effectiveness of each component. The evaluation process includes assessing the implementation of new technologies, the effectiveness of training, and the engagement of participants in the programme. The evaluation team collects data directly from the field and conducts interviews with participants to understand the challenges they face and provide appropriate solutions.

Figure 4. Collaboration and Support of PKM Activities

The results of this collaboration have been very positive, with the capacity of the businesses to utilise technology and operational management to improve the productivity and competitiveness of their products. Evaluations show that the programme components are functioning well and bringing tangible benefits to the community, such as improved production efficiency and increased business income. Continued support from various parties also helps ensure that these benefits can be felt in the long term, providing a strong foundation for better local economic development in Cilembu Village.

Mentoring and Evaluation

Mentoring and evaluation aims to provide ongoing support and assess the impact of activities. Mentoring is conducted directly on site to provide technical assistance and ensure proper implementation. During this period, monitoring and feedback are collected to assess the success of the activities. The mentoring and evaluation of the programme for Cilembu yam MSMEs in Cilembu Village shows that the programme has had an impact. The monitoring and feedback collected provide an overview of the programme's success, although there are still some challenges that need to be addressed. The evaluation of this programme is based on several success criteria presented in Table 2

Table 2. Evaluation of this programme based on several success criteria.

Evaluation Criteria	Indicators	Before Training	After Training
Benchmarks for Successful Implementation of Activities	Schedule and Number of Meetings	Activities as scheduled, six main meetings.	All meetings were conducted on time with full participation from participants.
	Implementation as planned	Activities proceeded as planned, with a focus on technology and operational management.	More efficient implementation with optimised use of time and resources, including additional marketing-related materials.
Participant Success Benchmarks	Participant Profile	45% were women aged 56-80 years; 65% had primary school education; the majority were housewives (99%).	The participant profile remained dominant in the 56-80 age group, but the participation of young participants (20-30 years old) increased to 20%.
	Ability to Apply Knowledge	72.26% use digital technology for marketing, the majority only use social media.	The use of digital technology increased to 85%, with 40% of participants starting to use e-commerce platforms such as Tokopedia and Shopee.
	Productivity and Marketing Challenges	61.51 per cent identified productivity as a key challenge; 54.19 per cent faced marketing issues.	Productivity challenges decreased to 40 per cent, while marketing issues decreased to 35 per cent, indicating an increase in participants' capacity to manage their businesses.
Measures of Implementation Success	Effectiveness of Explanations and Assistance	Support and training was successful in 77.63% of participants.	Training effectiveness increased to 90%, with more participants able to implement technology and operational management in their businesses.
	Communication and Responsiveness	The implementer is considered responsive with good communication.	Improved responsiveness to 95%, with more structured communication and more intensive technical support.

The evaluation showed that the programme had successfully provided support and education to Cilembu yam MSMEs. The programme went according to plan and had a positive impact on improving participants' knowledge and skills, especially in the use of digital technology. However, challenges related to productivity and marketing still need to be addressed, including capital raising, plant disease management, and adaptation to the unpredictable climate.

Stimulus and Product Development

At the Stimulus and Product Development stage, the main focus was on improving the creativity and production capabilities of the trainees. Participants were divided into six groups, where each group was given a stimulus to develop a new product based on the skills and knowledge gained from the previous training. The product development process involves several important steps that include concept development, production, and marketing as shown in Table 3.

Table 3. Stimulus and Product Development to Promote Economic Independence

Stages	Description	Results
Group Division	Participants were divided into 6 groups to develop new products based on the training results.	6 groups were formed with a focus on developing processed products from Cilembu yam.
New Product Development	Each group developed an innovative product based on local raw materials (Cilembu yam).	Various new products were developed, including yam chips, yam brownies and other processed products.
Production	Participants carried out the production process by utilising the technology and equipment introduced during the training.	The production process ran efficiently, and the participants managed to produce products with standardised quality.
Product Marketing Assistance	Teams from UNMA and UNWIM provide assistance in product marketing, including branding, packaging, and digital marketing..	Participants successfully marketed their products in the local market, with some products starting to be marketed outside the region.
Impact	The positive impact of the stimulus and product development stages on increasing participants' creativity and production capacity.	Increased income of business actors, growth of small businesses in the region, and the potential for wider marketing of products, providing a sustainable impact on the local economy

Discussion

This programme has shown success and had a positive impact on Cilembu yam MSME players in Cilembu Village. In the initial stage, activities were conducted through six meetings with the participation of 30 participants. The majority of participants were women aged 56-80 years old with basic education backgrounds, most of whom were housewives. The focus of the training was on the introduction of digital technology and operational management relevant to their MSME activities. Although participants initially faced challenges in terms of productivity and marketing, the training programme successfully helped them improve their ability to address these issues. This improvement can be seen in the participants' ability to utilise digital technology to support their business activities, leading to increased effectiveness in marketing and operations. These results suggest that the training has played an important role in strengthening the capacity of Cilembu yam MSMEs and helping them to be more adaptive to changes in the digital era (Sutanto et al., 2021).ati & Putri, 2020).

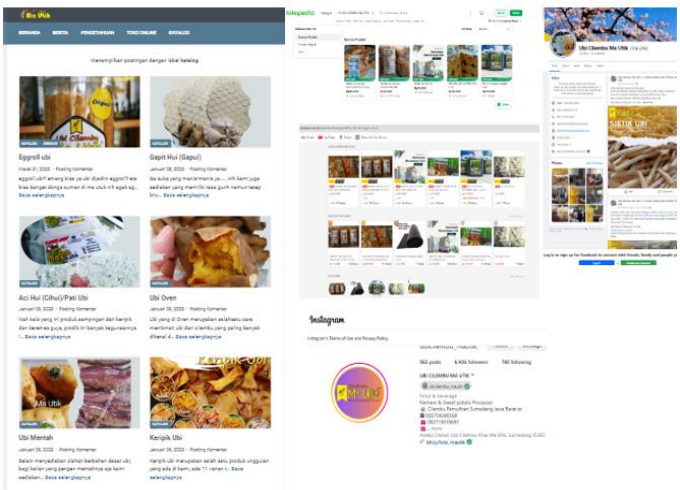

Figure 5. Use of Digital Technology in Product Marketing

The programme implementation went according to the initial plan, which included training on digital technology and operational management for Cilembu yam MSMEs. Programme evaluation and monitoring showed that most participants were able to apply the knowledge they gained during the training, especially in the use of digital technology for product marketing. Before the additional training, 72.26% of participants had used social media such as Facebook and Instagram to market their products. After the training, this figure increased to 85%, with some participants having successfully transitioned to e-commerce platforms to expand their market and increase their sales. This increase in the use of digital technology reflects the success of the programme in equipping participants with relevant skills in the digital era. By utilising digital technology, MSME players can now optimise their marketing efforts, which is expected to increase their productivity and competitiveness in the wider market (Nurhayati & Putri, 2020).

Participation from younger age groups increased during the programme implementation. Initially, only 13% of participants were aged 20-30 years, but after the programme, the participation rate from this age group increased to 20%. This increase in participation from the younger generation shows that the programme was able to attract them to be involved in Cilembu yam MSME business development. The presence of the younger generation is crucial as they bring new perspectives and innovative skills, especially in the utilisation of technology and the development of creative ideas that can boost the sustainability and competitiveness of MSME businesses. As more young people are involved, the programme will not only have a positive impact on current MSME actors but also potentially ensure the sustainability and development of businesses in the future. The younger generation has a strategic role in strengthening the capacity of MSMEs, especially in adopting digital technology and making innovations needed to face the challenges of an increasingly competitive market (Agustina & Dinar, 2022). Through this training, they are expected to continue contributing to strengthening the local economy and helping Cilembu yam MSMEs grow.

Figure 6. Participation of participants during programme implementation

However, while the programme has shown improvements in various aspects, challenges related to productivity and marketing still require further attention. Prior to the training, 61.51% of participants identified productivity as a key challenge, and 54.19% faced marketing issues. After the programme, these challenges decreased, with 40% of participants still experiencing productivity issues and 35% facing marketing challenges. This evaluation emphasised the need for continued assistance, especially in terms of increasing productivity and developing more effective marketing strategies. This is in line with the results of community service conducted by Suryani, W. et al. (2019), where it was found that consistent mentoring has a significant impact on increasing the productivity of micro businesses. Similarly, Lestari, D. et al. (2020),

reported that training complemented by intensive mentoring succeeded in overcoming most of the marketing problems faced by small business actors in the agricultural sector.

The implementation team can be interpreted as successful in providing explanations and assistance to participants, with a satisfaction rate of 77.63%. After additional training materials and more intensive mentoring, 90% of participants reported being able to apply the materials taught in their businesses. In addition, the responsiveness of the implementation team to questions and problems faced by participants increased to 95%, indicating an improvement in the quality of communication and technical support provided.

The results of this service show that the programme has had a positive impact on participants' knowledge and skills, particularly in the use of digital technology. However, the remaining challenges need to be addressed with continued mentoring to ensure more sustainable success for the Cilembu yam MSME players. Research by Rahman, A. et al. (2021) also emphasises the importance of digital technology integration in improving the competitiveness and productivity of micro-enterprises in rural areas, which is one of the main focuses of community service.

Conclusion

The implementation of the service programme went according to the initial plan, including training scheduling and participant identification. Most of the participants came from the Ma Utik group with basic education backgrounds. Good cooperation between the university, government, and MSME players has been well established. Initial participation reached 30 participants, with the use of digital technology for marketing increasing from 72.26% to 85% after the training. The programme managed to attract more young participants, with participation from the 20-30 years age group increasing from 13% to 20%. Evaluation results show that the programme had a positive impact on participants' ability to apply digital technology for marketing. Challenges in productivity and marketing were reduced. The effectiveness of the training increased significantly, with the implementer's responsiveness to participants' needs reaching 95%.

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