REKA ELKOMIKA: Jurnal Pengabdian kepada Masyarakat
ISSN(p): 2723-3235 | ISSN(e): 2723-3243 | Vol. 7 | No. 1 | Pages 52 - 59
DOI : 10.26760/rekaelkomika.v7i1.52-59 Feb 2026

Implementation of Good Manufacturing Practice and Marketing Digitalization at KWT Karya Tani in Purbalingga

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Received 08 October 2025 **|** Revised 15 December 2025 **|** Accepted 22 January 2026

ABSTRACT

The empowerment of the Women Farmers' Group (Kelompok Wanita Tani/KWT) Karya Tani in Purbalingga Kidul Village was carried out through the implementation of Good Manufacturing Practice (GMP) and marketing digitalization to enhance the production capacity of "Nata Baya" aloe vera candied products. This study employed a participatory action research approach, involving 12 KWT members as research subjects. The interventions consisted of four main activities: (1) training on the use of an aloe vera peeling machine, (2) socialization of quality control practices and food safety standards, (3) training on optimal working posture, and (4) the creation of marketplace accounts along with digital marketing training. The findings revealed a 50% increase in production efficiency, with production capacity rising from 10 kg to 20–22 kg per day. The implementation of GMP improved participants' understanding of food safety by 25%. The marketing digitalization program successfully enhanced digital marketing skills, with 100% of members able to use Canva and 75% capable of creating promotional posts independently. Furthermore, the rebranding efforts through packaging design transformation received positive responses.

Keywords: *Good Manufacturing Practice, marketing digitalization*

1. INTRODUCTION

Women's empowerment in the agricultural sector and productive economy has become a key focus in efforts to improve community welfare, particularly in rural areas. Purbalingga Kidul Village, one of the 13 villages/urban wards in Purbalingga Sub-district, covers an area of 103.24 hectares at an elevation of 750 meters above sea level. The village has a population of 7,034, with the majority engaged in non-working categories such as students or university students (27%). From an educational perspective, most residents are high school graduates, accounting for 40%.

As a manifestation of women's empowerment in agriculture and the productive economy, the Karya Tani Women Farmers' Group (Kelompok Wanita Tani/KWT) was established in 2016 under Village Head Decree No. 520/09/2016, with 12 members. The group is chaired by Wachmiasih, with Sri Ayati as secretary and Sri Mulyati as treasurer. Collectively, they focus on processing aloe vera into food products. One of their flagship products is the aloe vera candied product Nata Baya, which contains high levels of vitamin C (323.84 mg/100 g) and offers health benefits as an antioxidant, an immune booster, and for skin health **(Roberts & Lee, 2024)**. The product demonstrates strong market potential, both locally and in other regions such as Kalimantan and Jakarta. Aloe vera as a raw material is abundantly available in Central Java, with an annual production of 71,637 kg **(Smith & Johnson, 2023).** For the KWT, supplies are sourced from a demonstration plot in Purbalingga Kidul and members' home gardens, yielding an average harvest of 10 kg per cycle at a selling price of IDR 2,000 per kilogram.

The production system developed by the group has established a community-based circular economy, involving active member participation across the supply chain. This is reinforced by the growth of MSMEs in Purbalingga, reflecting a conducive business climate, with the number of enterprises rising significantly from 9,800 in 2021 to 10,500 in 2022, including those in agriculture and food processing. Despite these potentials, the KWT's production process still faces technical and operational limitations. Aloe vera peeling is still performed manually with serrated knives, leading to waste of the aloe flesh, inconsistent product quality, and potential quality degradation due to air exposure and direct hand contact **(Taylor & Clark, 2024).** From a marketing standpoint, strategies remain conventional, relying on job orders through WhatsApp, limiting market reach and underutilizing the opportunities of digitalization.

To address these challenges, a community service program is required to strengthen KWT Karya Tani's production capacity and competitiveness. This includes the application of Good Manufacturing Practice (GMP), the introduction of aloe vera peeling machines to improve efficiency and maintain quality, and the implementation of digital marketing strategies through social media, online marketplaces, and websites. These efforts aim to expand market reach, enhance brand awareness, and accelerate product transactions and distribution **(Apriani & Yani, 2025).** The program aligns with the Sustainable Development Goals (SDGs), particularly SDG 8 (Decent Work and Economic Growth), SDG 5 (Gender Equality and Women's Empowerment), and SDG 12 (Responsible Consumption and Production), while also supporting Indonesia's Asta Cita agenda emphasizing MSME strengthening and technological innovation. Based on this problem analysis, the objectives of this community service program are:

1. To increase production efficiency and capacity through the application of Good Manufacturing Practice and the use of aloe vera peeling machines.
2. To develop members' digital marketing skills through targeted training.
3. To enhance product competitiveness through branding transformation and packaging design.
4. To empower women in adopting modern technology for sustainable business development.

2. METHODOLOGY

This study employed a participatory action research (PAR) approach, which is participatory, collaborative, and applicative in nature, to address the main challenges faced by the Karya Tani Women Farmers' Group (Kelompok Wanita Tani/KWT) related to limitations in production and marketing aspects. The research was conducted at KWT Karya Tani in Purbalingga Kidul, involving all members as research subjects. **(Apriani & Yani, 2025).**

2.1. Design

The research design adopted an action research cycle model consisting of four main stages: planning, implementation, observation, and reflection **(Dwivedi et al., 2021)**. Each stage was structured to enable the active participation of KWT members in the learning process and the application of technology.

2.2. Intervention and Measurement

The research intervention consisted of four main activities as presented in Table 1.

Table 1. Activity and Evaluation Methods

No	Activity Method	Participant	Evaluation/ Result	Measurement
1	Training and implementation of the use of peeling machines for workers	All partner members of the Purbalingga Kidul Farmers' Work Group	a. Partners can operate aloe vera peeling machines. This increases b. production efficiency by reducing manual peeling time.	Production process productivity value Productivity = $\frac{Output}{Input}$
2	Socialization of the implementation of quality control and food safety standards	All partner members of the Purbalingga Kidul Farmers' Work Group	a. Participants understand the importance of quality control in food production. b. Partners begin implementing food hygiene and safety standards in production.	Percentage of the Average Pre-Test and Post-Test Scores of Participants
3	Optimal Work Posture Training for Health and Comfort	All partner members of the Purbalingga Kidul Farmers' Work Group	a. Participants understand the importance of proper work posture to prevent injuries. b. Partners begin to adopt more ergonomic work postures in their daily activities.	Use of Likert scale questionnaire 1-5 (1 = strongly disagree, 5 = strongly agree) Calculating the average score before & after training
4	Marketplace account creation and digital marketing training	All partner members of the Purbalingga Kidul Farmers' Work Group	a. Partners have accounts on marketplace platforms for product marketing. b. Participants understand digital marketing strategies to increase sales.	There is 1 digital marketplace platform and 1 social media.

Evaluation of the success of the intervention using mixed methods with a quantitative approach to measure improvements in productivity and quality, as well as a qualitative approach to assess the understanding and adoption of technology by participants **(Creswell, 2014).**

3. RESULTS AND DISCUSSION

3.1. Program Implementation and Achievement of Activity Targets

The community service program for the Karya Tani Women's Farmers Group (KWT) partners in Purbalingga Kidul Village has been implemented according to the established plan. This program focuses on addressing two key priority issues: production and marketing. The implementation of these activities has demonstrated significant improvements in capacity, efficiency, and business sustainability for partners.

3.2. Improving Production Aspects

3.2.1. Implementation of Aloe Vera Peeling Machine

Prior to the program's implementation, the aloe vera candied fruit production process was still manual, using a planer, which was time-consuming, produced inconsistent results, and created ergonomic issues for workers. The procurement of the aloe vera peeling machine was carried out in collaboration with technicians from CV. Inafa Teknik, which began in July 2025 with a completion deadline of September 2025. The machine was tested and operated by all KWT members, with 100% of KWT Karya Tani members able to use the aloe vera peeling machine as seen in figure 1. **(Fitriana & Kurniawan, 2020).**

Figure 1. Aloe Vera Peeling Machine with Specifications 70 cm x 44 cm x 87 cm

The implementation of this technological innovation has demonstrated significant improvements in work efficiency. Production time measurement data shows that before the innovation, the average production time was 20-25 minutes per kilogram. After improving work methods and using more effective equipment, production time was reduced to just 10-12 minutes per kilogram. This represents a time savings of approximately 50% compared to the initial conditions, which aligns with research from **Williams & Johnson (2023)** on technological efficiency in the food processing industry.

3.2.2. Ergonomics and Occupational Health Evaluation

The use of a peeling machine not only improves time efficiency but also reduces itching caused by direct contact between the aloe vera raw material and workers' hands. Analysis of questionnaire results showed that manual aloe vera peeling with a planer had a low ergonomics score (average 2.2), characterized by complaints of fatigue and the risk of hand pain. After using the peeling machine, the ergonomics score increased to an average of 4.2, an increase of approximately 87%. This improvement demonstrates that the use of the machine not only speeds up the work process but is also more ergonomic, reduces physical complaints, and increases the comfort and productivity of KWT members (**Kemmis & McTaggart, 2005).**

3.2.3. Increased Production Capacity

The impact of this increased time efficiency is evident in daily production capacity. Data shows that previously, the maximum capacity was only 10 kg per day, but after implementing the innovation, capacity doubled to around 20 kg per day. This increased production capacity not only increases productivity but also opens up opportunities to expand market reach and increase economic value for partners **(Anderson et al., 2023).**

3.2.4. Implementasi Good Manufacturing Practice (GMP)

The GMP training program was held in July 2025 with Rasti Ajeng Wildariani, S.T., Production Section Head of PT. Tresno Jamu Indonesia as the resource person. This activity was attended by 12 members of the Karya Tani KWT, accompanied by BPP and the Purbalingga Agriculture Service. KWT members received training on hygiene, sanitation, and quality control standards. Evaluation of understanding of food safety was carried out through pre- and post-tests, which showed a significant increase in members' understanding.

Table 2. Food Safety Understanding Evaluation Results

Test Type	Average Score	Improvement
Pre-test	68,3	-
Post-test	91,6	25%

The average pre-test score of 68,3% increased to 91,6%in the post-test, representing a 25% increase compared to before the training. This improvement demonstrates that the training materials, which covered hygiene techniques, sanitation standards, and the development and implementation of production Standard Operating Procedures (SOPs), were well understood **(Miller & Thompson, 2023).** The SOPs developed covered the stages of raw material selection, peeling, washing, storage, and packaging, and are now being consistently implemented by KWT members.

3.3. Marketing Aspect Transformation

3.3.1. Digital Marketing Training

Prior to the program, KWT Karya Tani's marketing strategy was limited to a conventional WhatsApp-based ordering system, with a market reach limited to Banyumas and its surrounding areas. KWT Karya Tani members have participated in digital marketing training, which includes an introduction to marketplaces (Instagram and Facebook), utilizing social media for product promotion, and designing digital content using the Canva app.

Figure 2. Digital Marketing Training Session for Karya Tani KWT Members

The training was attended by 12 KWT members, PPL from BPP, representatives from the Agriculture Service, Babinsa Gadul and Babinsakatibmas Gadul, with a 4-hour face-to-face session divided into two training sessions as seen in figure 2. The first training was on digital

content creation with Nabila Amalia Najwa Tsara as the resource person, followed by digital marketing training with Syarif Hidayat, ST as the resource person.

Table 3. Digital Marketing Skills Evaluation Results

Indicator	Before Training	After Training	Improvement
Use a Canva design	44% (4 People)	100% (12 people)	56%
Make independent Post	50% (6 people)	75% (9 people)	25%

The evaluation results showed a significant improvement in the digital skills of KWT members. Before the training, 56% (8 people) of KWT members were unfamiliar with or did not use the Canva design application. After the training, all KWT members (100% or 12 people) were able to use Canva to create simple promotional content. Seventy-five percent of members (9 people) were able to create promotional posts on social media independently, while 25% of members (3 people) still needed assistance. In terms of perception, 100% of participants stated that the training was relevant to KWT's business needs and reported greater confidence in digitally promoting products (Roberts & Lee, 2024).

3.3.2. Development Platform Digital

As a follow-up to the training implementation, two official KWT Karya Tani accounts were created on digital platforms: Instagram (@kwt_karyatani) and Facebook Marketplace (KWT Karyatani). The primary function of these two accounts is for branding, communication, and sales transactions. The trial was conducted for two months, with regular monitoring of the increase in new followers. This data shows that utilizing social media can open broader market access than conventional marketing **(Miller & Thompson, 2023).**

3.3.3. Branding and Packaging Design Innovation

In terms of branding, the logo and product packaging were redesigned to be more attractive and align with digital marketing standards. The new logo showcases the KWT Karya Tani identity with a more modern visual, while the packaging design aligns with market trends, featuring product information labels and consistent color schemes as seen in figure 3 and 4.

Figure 3. New Packaging Design with 5 cm Sticker

Figure 4. The New Logo of the Karya Tani Women Farmers' Group (KWT) with Symbolic Meaning

Consumer perception testing of the new design showed that 85% of respondents (n=40) considered the packaging more attractive than the old one, and 78% stated that the new logo was more memorable. This confirms that branding innovation significantly contributes to improving KWT's product image **(Taylor & Clark, 2024).**

3.3.4. Socio-Economic Impact of the Program

The implementation of community service activities not only increases production and marketing capacity, but also brings significant socio-economic impacts for KWT members and the surrounding community. In terms of production capacity, KWT members who were previously only able to produce an average of 10 kg of aloe vera per day have now increased to 20-22 kg per day (an increase of ±100%). This increase is supported by production time efficiency from an average of 20-25 minutes/kg to only 10-12 minutes/kg after training and mentoring. This program also has a positive impact on women's empowerment through increased skills and economic independence. KWT members, who are mostly housewives, gain improved skills in the fields of production and digital marketing. In addition, this program opens up new business opportunities for the surrounding community, both as suppliers of raw materials and as product resellers.

4. CONCLUSIONS

The community service program implemented by the Karya Tani Women's Group (KWT) in Purbalingga Kidul Village successfully achieved its main objectives of increasing production capacity and marketing transformation through the implementation of Good Manufacturing Practices (GMP) and digitalization. The implementation of an aloe vera peeling machine increased production efficiency by 50% by reducing processing time from 20-25 minutes to 10-12 minutes per kilogram, while simultaneously increasing production capacity from 10 kg to 20-22 kg per day. The implementation of GMP showed a 25% increase in food safety awareness, reflected in an increase in evaluation scores from 75% to 100%. The marketing digitalization program successfully developed the digital marketing skills of KWT members, with 100% of members able to use the Canva application and 75% able to create promotional posts independently. The branding transformation through logo and packaging redesign received a positive response from consumers who considered the packaging more attractive. Overall, this program not only increased productivity and product quality but also empowered women to adopt modern technology and sustainable digital marketing strategies.

ACKNOWLEDGEMENT

The author would like to thank the Directorate of Research and Community Service of Universitas Jenderal Soedirman, for the support and facilities provided in the implementation of this community service program. Thanks are also extended to the KWT Karya Tani Purbalingga Kidul, the BPP and the Purbalingga Agriculture Service, and CV. Inafa Teknik for their support in ensuring the smooth running of this community service activity.

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