MALLOMO: Journal of Community Service
https://jurnal.umsrappang.ac.id/mallomo/index
Vol 6, No, 2, Juni 2026, pp 1077-1085
ISSN: 2774-7220 (online)

EMPOWERING CASSAVA FARMERS THROUGH DEVELOPMENT OF MOCAF CHIPS AND COOKIES PRODUCTS IN PUUNDAIPA VILLAGE COMMUNITY

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Artikel info

Abstract. *Pengabdian kepada masyarakat ini bertujuan untuk meningkatkan kapasitas dan kemandirian ekonomi petani singkong melalui pengembangan produk olahan bernilai tambah di Desa Puundaipa, Kabupaten Kolaka. Potensi singkong di desa tersebut cukup melimpah, namun pemanfaatannya masih terbatas pada penjualan hasil panen dalam bentuk umbi segar dengan nilai ekonomi yang rendah. Kegiatan ini difokuskan pada transfer teknologi produksi keripik singkong dan cookies berbasis tepung MOCAF (Modified Cassava Flour) sebagai upaya diversifikasi produk serta peningkatan daya saing komoditas lokal. Metode pelaksanaan meliputi sosalisasi, pelatihan teknis, pengenalan alat sederhana, pendampingan, proses produksi. Evaluasi dilakukan melalui observasi, wawancara, dan kuesioner untuk menilai peningkatan pengetahuan, keterampilan, serta minat petani dalam mengembangkan usaha olahan singkong. Hasil kegiatan menunjukkan adanya peningkatan pemahaman peserta terkait teknik pengolahan, standar kebersihan pangan, serta manajemen usaha sederhana. Peserta mampu memproduksi keripik singkong dengan tingkat kerenyahan yang stabil dan cookies MOCAF dengan karakteristik aroma serta tekstur yang diterima secara sensori. Kegiatan ini berkontribusi pada terbentuknya peluang usaha rumah tangga berbasis komoditas lokal serta memperkuat transformasi ekonomi petani menuju pengolahan produk bernilai tambah*

Abstract. *This community service aims to increase the capacity and economic autonomy of cassava farmers through the development of value-added processed products in Puundaipa Village, Kolaka Regency. The village has abundant cassava resources, however, utilization is still limited to low-value sales of fresh tubers. This activity focuses on transferring production technology for cassava chips and cookies made from MOCAF (Modified Cassava Flour) as an attempt to diversify products and increase the competitiveness of local commodities. This project's implementation methods included socialization, technical training, mentoring, and production processes.*

Evaluation was through observation, interviews, and questionnaires to assess improvements in farmers' knowledge, skills, and interest in developing cassava processing businesses. Results showed participants had a better grip on processing techniques, food hygiene standards, and basic business management. Participants were able to produce cassava chips with a consistent level of crispness and MOCAF cookies with sensory-accepted aroma and texture characteristics. This activity contributed to the creation of household business opportunities based on local commodities and strengthened the economic transformation of farmers toward the processing of value-added products.

Keywords:
Cassava; Mocaf; Chips; Cookies; Empowering.

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INTRODUCTION

Puundaipa Village, located in Kolaka Regency, has an area of 258.16 hectares, and most of its residents work as laborers and farmers (Puundaipa, 2024). It has a lot of potential for agriculture. The cassava is one of the most widely cultivated and abundant crops. However, the utilization of cassava harvests by community groups, local farmers, households, and Micro, Small, and Medium Enterprises (MSMEs) are still limited to traditionally processed products or sold in fresh form. The result is an unstable income for the community due to the relatively low market value of cassava.

Cassava (Manihot esculenta Crantz) is a local food commodity that plays a vital role in supporting food security and food diversification in Indonesia. Cassava tubers are rich in carbohydrates in the form of starch, and contain protein, fat, iron, vitamin A, vitamin C, vitamin B1, potassium and phosphorus, thus holding great potential as a raw material for various processed food products, both traditional and modern (Defri et al., 2022; Estiasih et al., 2017). However, fresh cassava has a major drawback in the form of a short shelf life due to its high water content and the activity of post-harvest microorganisms and enzymes ((Hayati, 2009; Tandrianto et al., 2014). This causes cassava to deteriorate easily if not processed immediately. Therefore, further processing is required to extend shelf life, increase added value, and diversify cassava-based products.

MOCAF (Modified Cassava Flour) is one of the potential forms of cassava processing. MOCAF is a cassava flour produced through a fermentation process; it has characteristics similar to wheat flour and therefore can be used as a raw material for various food products, including bakery products (Odey & Lee, 2020; Tandrianto et al., 2014) The use of MOCAF flour can also reduce dependence on imported wheat flour and encourage the increased use of local food ingredients.

The PKK Women's Group in Puundaipa Village plays a vital role in community empowerment. The PKK women's group can act as a driving force for improving household food processing skills and creativity. The PKK women's group in Puundaipa Village is led by Mrs Nurhaeni S.Pd, who is active in mobilising the village women to improve their food processing skills. Despite their high level of interest, the PKK group still faces limitations in the use of simple technology, processing techniques, and innovation in cassava-based product diversification.

The community service team was on hand to address these needs by providing education and technology transfer on cassava processing through the demonstration method. This initiative includes on-site training in making MOCAF flour, techniques for producing crispier and drier cassava chips, and the formulation of cookie recipes based on MOCAF that can be easily made using household appliances. The demonstration method was chosen because it allows participants to directly observe each step of the process, understand the techniques, and practice independently until they produce products that meet the required standards.

The two processed products—cassava chips and cookies based on MOCAF—are designed to strengthen household economies through agro-industrial activities that maximize local potential. Through this technical assistance, the community—particularly PKK groups and cassava farmers—can acquire new skills in transforming agricultural produce into value-added products, creating new business opportunities, and boosting income in a sustainable manner.

Data and Methodology

Community Service Location and Subject

The community service activity was carried out in Puundaipa Village, involving the PKK Women's Group as the primary partner, led by Mrs. Nurhaeni with 26 group members. This group was selected because it had been producing processed cassava products (cassava chips), but the technology they used was very traditional and lacked modern technology for processing cassava. Furthermore, the village is a center for cassava production, so the availability of raw materials supports the implementation of activities on a sustainable basis.

Community Service Methodology

This community empowerment activity was carried out in Puundaipa Village, Kolaka Regency, with the PKK women's group serving as the primary participants. The methodology used was the demonstration method. This method was chosen to ensure that technology transfer could be effectively applied to the participants. All stages were presented through brief theoretical explanations, demonstrations of tools and materials, and hands-on practice by the participants to ensure skill proficiency. This method allowed participants to observe, understand, and directly practice each process of processing cassava into chips and cookies made from MOCAF flour.

Applied technology

The new technology introduced involves the use of modern equipment in the cassava processing process, such as a chip slicer, an oil-draining spinner, a MOCAF drying oven, and a household-scale grinding machine. This technology aims to improve production efficiency, ensure consistent quality, and extend the shelf life of processed cassava products (Juliatmaja et al., 2024; Pambreni et al., 2024). The use of cassava slicing machines can improve the production efficiency of cassava chips (Mukhtar et al., 2025). The adoption of appropriate technology can increase the production capacity of food MSMEs by up to 40–60% and improve product hygiene standards. The use of slicing machines can reduce production time by up to 70% and improve the consistency of slice thickness by up to 90% (Yandi et al., 2020).

Stages of community services

The program was implemented in several phases. First, the program was introduced and identified the PKK group's priorities through initial discussions. Second, the team demonstrated the production process—starting with processing cassava into chips, followed by making MOCAF flour, and concluding with baking cookie-based MOCAF products. Participants were given hands-on practice

opportunities during these demonstrations. The third stage is production mentoring, where the participants are guided to make products independently with attention to standards of quality, sanitation, and equipment efficiency. The fourth stage is an evaluation via a questionnaire to measure knowledge, skills, and level of interest regarding the technology introduced. In this stage, participants are asked to provide feedback on the feasibility of the technology, knowledge gained, and the product's potential for business development.

Innstruments and Data Collection

Data were collected through closed-ended and open-ended questionnaires based on training indicators, which included: improvement in knowledge, technical skills, ability to operate equipment, and passion for entrepreneurship. The instruments were designed based on a participant-perception-based training evaluation model (Amah et al., 2025). As part of questionnaires, direct observation and documentation of photographs were used to record participant engagement during the activities.

Data Analysis

The data were quantatively and qualitatively analyzed. Questionnaire results were processed in the form of percentages and average scores to illustrate the level of understanding and acceptance of the technology. Meanwhile, qualitative data were derived from participants' comments and field observations to strengthen the interpretation of the training findings.

Performance Indicators

The success of the program is measured by several indicators: an increase in knowledge scores of at less than 70% and in practical skills of at least 80%, and a growing interest among participants in producing chips and cookies on a sustainable basis. Success is also gauged by the participants' ability to operate technical equipment independently..

Results and Discussion

Implementation of Cassava Processing Technologies by the PKK Women's Group

The training and demonstration of appropriate technologies received a positive response from all members of the PKK Women's Group in Puundaipa Village. The technologies introduced included a cassava slicer, a manual oil strainer, a drying oven, a MOCAF flour mill, and simple fermentation techniques. These technologies were selected because they are easy to implement on a household scale and require low operational costs. The use of appropriate technologies plays a significant role in supporting the sustainability of MSMEs (Cahyaningati et al., 2025). The use of simple tools designed to meet local needs can improve the productivity and quality of conventional food products (Arifin et al., 2025). The demonstration phase showed that all participants were able to complete the steps for making cassava chips and MOCAF cookies without any difficulties. Following a second practice session, the participants demonstrated greater independence in using the equipment, particularly during the oil-draining and drying processes. The participants are able to operate the equipment properly (Figure 1).

Cassava Slicing

Cassava chips Spining

Figure 1. The participants are able to operate slicer and spiner properly

The Questionnaires on Technology Understanding and Acceptance

To measure the effectiveness of the program, questionnaires were distributed to 20 members of the PKK. The questions covered their level of understanding of the technology before and after the training, how easy they found the tools to use, and their enthusiasm for continuing production on their own.

Table 1. Results of the Questionnaire Evaluation on Cassava Processing Technology Training

Criteria	Pre Training (%)	Post Training (%)
The concept of MOCAF production	15	92
Capacity of using a slicer	20	95
Capacity of using a drying oven	18	90
Capacity to use oil drainers	25	96
Continue production of cassava chips	40	100
Continue production of cassava chips	30	95

Table 1 shows an improvement in participants' skills following the training. This improvement indicates that the demonstration and practice methods are effective in enhancing participants' competencies. Repeated hands-on practice can improve participants' understanding and skills because it helps build procedural memory through active learning experiences (Kolb, 2014). Furthermore, the data suggests that incorporating feedback during practice sessions can further accelerate skill acquisition, allowing participants to refine their techniques and apply their knowledge more effectively in real-world situations. This approach not only boosts confidence but also fosters a deeper engagement with the material.

Participants showed a significant increase in their understanding of the MOCAF concept, rising from 15% to 92%. Prior to the training, they were only familiar with standard cassava flour and did not recognize the fermentation process that gives MOCAF its wheat-like qualities. After the training, most participants were able to explain the role of fermentation in reducing cyanide levels, increasing solubility, and facilitating application in the production of baked goods. Regarding production interest, all participants (100%) stated they were ready to continue producing cassava chips using the simple technology that had been introduced.

These findings align with the research by Kartikasari et al (2023) and Utomo et al., (2024), which showed that practice- and technology-based entrepreneurship training can increase the motivation and participation of rural women in productive business activities.

Technology adoption's effects on the features and quality of products

The adoption of simple technologies has significantly enhanced the quality of cassava-based products produced by the PKK women's group. For cassava chips, the use of a slicer ensures more uniform slices, enabling even frying, which results in a brighter color and reduced risk of burning. Furthermore, using an oil spiner equipment makes it possible to minimize the oil content more successfully, producing chips with a crispier texture and around 40% less oil (Figure 2). These findings are consistent with Adriana & Syahyuniar (2019); Riyadi et al (2023), which describe how using an oil-draining device to lower the oil content of cassava chips can enhance the product's quality and increase its shelf life.

Before training

After Training

Figure 2. Cassava Chips

Through this community service program, members of the PKK women's group received comprehensive training and continuous mentoring covering all stages of production, including the use of appropriate processing technologies, quality control, and product packaging. This assistance enabled participants to improve their technical skills and successfully produce market-ready cassava chips that met basic quality standards and featured more attractive packaging (Figure 2). The program not only enhanced product quality and marketability but also strengthened the participants' entrepreneurial capacity. Furthermore, it is expected to support the development of sustainable home-based enterprises utilizing local food resources, thereby creating added economic value and contributing to community empowerment at the village level.

MOCAF

Mocaf cookies

Figure 3. Cassava diversification product

The texture of MOCAF cookies is significantly different due to the application of fermented flour. Because MOCAF particles are finer and more homogeneous, the cookies are crispier, smell better, and are less likely to crumble (Figure 2). Participants also discovered that controlling the oven temperature is essential for the color of the cookies and that the length of fermentation influences the properties of the flour. The final products created during the training demonstrate that the PKK members are capable of producing two types of products that are consistent in quality and have the potential to be developed as village MSME products.

Analysis of the Economic Potential and Sustainability of the Program

The results of the activities show that the application of cassava processing technology not only improved the technical skills of the PKK women but also opened up promising economic opportunities for the community of Puumadipa Village. Based on the evaluation results, 85% of participants stated they were ready to regularly produce cassava chips and MOCAF-based cookies as a home-based business. This readiness is driven by the ease of use of the introduced technologies—such as slicers, oil-draining devices, and drying ovens—which are considered simple, economical, and easy to maintain.

The plentiful supply of cassava in Puundaipa Village is a crucial element that supports the sustainability of the program. With relatively low production costs and the skills gained through training, the PKK women's group has a significant opportunity to establish cassava-based businesses by engaging with local markets, including small shops, village markets, and catering for events. The abundance of cassava as a raw material in Puunadipa Village is a key factor supporting the program's sustainability. With relatively low production costs and the skills they acquired through training, the PKK women's group has a great opportunity to develop cassava-based businesses by tapping into local markets, such as small shops, village markets, and event catering orders. The products also have the potential to be scaled up through improved packaging, enhanced hygiene standards, and the implementation of simple marketing strategies.

Overall, this initiative has laid a strong foundation for the development of cassava-based MSMEs in Puumadipa Village. The combination of appropriate technology, improved skills, and local market opportunities creates positive prospects for economic sustainability. Through the production of cassava chips and MOCAF cookies, the PKK women not only derive added value from local agricultural products but also have the potential to become a driving force for the village's sustainable economy.

This initiative helps achieve the Sustainable Development Goals (SDGs) by creating more income opportunities for the community (SDG 1: No Poverty), empowering women in work (SDG 5: Gender Equality), developing small businesses based on local resources (SDG 8: Decent Work and Economic Growth), and using local materials and suitable technologies to make food products better (SDG 12: Responsible Consumption and Production). Therefore, this initiative not only produces market-ready cassava product but also strengthens the community's economic capacity in a sustainable manner.

Conclusion

The processing of cassava into chips and cookies using MOCAF flour in Puumadipa Village successfully enhanced the knowledge and skills of the PKK women's group in processing cassava using appropriate technology. The training results demonstrated an increase in participants' understanding of MOCAF production and equipment use, as well as their interest in continuing production independently.

The application of simple technologies such as a slicer, a drying oven, a MOCAF grinder, and an oil-draining tool also improved the quality of the final products. The chips became crispier and more uniform, while the MOCAF cookies exhibited better and more consistent quality.

Overall, this initiative successfully increased the value of local cassava while creating business opportunities for the PKK women's groups. With ongoing guidance and support, this initiative has the potential to support the development of local food businesses and enhance the economic self-reliance of the village community.

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