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Integrating Modern Cassava Processing and Digital Marketing to Strengthen Local Businesses in Angat Buhay Village, Philippines

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ABSTRACT

This international community service program was carried out in Angat Buhay Village, Philippines, to increase community capacity in cassava processing and digital marketing. The main problem of partners is the limited skills in food technology, production facilities, and offline and digital marketing. The solutions provided include training in cassava processing (mocaf and chips), the provision of modern tools (graters, dryers, vacuum sealers), and training in digital marketing strategies through social media and marketplaces. The results of the activity show an increase in partners' production capacity, partners producing new products (mocaf and chips), partners having social media, and an increase in sales through digital channels. The program also strengthens international academic collaboration (Warmadewa - UNC).

Contribution to Sustainable Development Goals (SDGs)

SDG 1 – No Poverty

SDG 2 – Zero Hunger

SDG 12 – Responsible Consumption and Production

1. INTRODUCTION

1.1. Background

Angat Buhay Village is located in the Sagñay region, Camarines Sur, Philippines. Based on the results of a needs assessment conducted by the Institutionalised Community Extension Services of Nueva Caceres University, the village faces challenges across the economy, education, and community skills. The village is inhabited by a population that largely relies on agriculture and natural resource-based economic activities.

In terms of education, the majority of the population has a junior high school education. Based on the data collected, only 7 of the respondents' family members reached the university level, while the majority were still pursuing primary to upper secondary

education. Limited access to technology and educational resources is the main obstacle to increasing community capacity, both in formal and non-formal education.

From an economic perspective, villagers show a strong interest in developing economic skills using local resources. The results of the needs assessment showed that 55% of respondents stated the availability of natural resources that can be processed as economic potential. However, only a small percentage have the skills or experience to manage these resources into high-value products. This is evident from the lack of respondents with knowledge of agricultural product processing or adequate marketing skills.

Angat Buhay Village in Camarines Sur, Philippines, has potential for cassava farming. It has abundant agricultural resources, especially cassava, a leading commodity. Cassava can be processed into various derivative products, such as mocaf



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(modified cassava flour), cassava chips, tape, and other fermented products, which have a higher selling value. The community shows strong motivation to learn, as reflected in more than 91% of respondents who are interested in participating in entrepreneurship and economic skills training. The involvement of local farmer groups and their enthusiasm for community service programs are significant sources of social capital. Cassava-based products have opportunities in local and regional markets, especially if supported by digital marketing strategies (marketplace, social media, e-commerce). Local products with the narrative "Cassava from Angat Buhay Village" have the potential to attract the market through branding grounded in local wisdom, sustainability, and community empowerment.

However, there are problems, namely that the community still lacks skills in agricultural product processing and effective marketing strategies. There is no understanding of branding, promotional content, and social media strategies. 50% of respondents admitted they lack digital marketing skills. Most cassava is sold in raw form, so the added value is low.

Solutions to these problems include training in cassava processing techniques, procurement and training in the use of modern equipment, education on food safety standards and certifications, and the use of social media. This condition underscores the need for intervention, namely, increasing the capacity in food technology and digital marketing. This program also supports MBKM policies by providing students with real-world experience and leveraging lecturers' contributions to empower cross-border communities.

2. Methodology

The community service program in Angat Buhay Village will be implemented through a series of systematic stages designed to ensure the successful implementation of the solutions that have been designed. This implementation method comprises several main stages: socialisation, training, technology application, and mentoring. In addition, the evaluation and sustainability of the program are important factors in ensuring its long-term impact on the community.

The program is carried out through several stages. The methods carried out are:

1. Socialization, namely meetings with village governments, farmer groups, and community leaders. The socialisation stage is a crucial first step in implementing the program. At this stage, the main goal is to introduce the program to the people of Angat Buhay Village, especially the target beneficiaries. Through socialisation, the community is expected to understand the purpose and benefits of the service programs offered, including the economic opportunities they offer. In addition, this process is intended to delve deeper into the community's needs through direct discussions with target partners, ensuring that the programs carried out are in line with field realities. No less important, socialization aims to build commitment and encourage active community involvement in every stage of program implementation.
2. Training, namely cassava processing technology (ingredient selection, fermentation, drying, GMP & HACCP) and digital marketing (branding, content, marketplace, social media). This training is designed to increase community capacity in three main areas, namely food technology in cassava processing, digital and offline marketing, and guided

community empowerment. With the synergy of these three fields, it is hoped that the community will not only be able to process cassava into value-added products but also have effective marketing strategies and awareness to strengthen community empowerment. The training will be delivered in theoretical and practical sessions that combine concept presentation, direct demonstrations, and independent practice. The modules cover technical, managerial, and marketing strategy aspects. In the food technology section on cassava processing, participants were invited to learn how to select high-quality cassava according to its designation, as well as post-harvest handling to maintain the freshness and quality of raw materials. Furthermore, they will receive practical training in cassava massage, fermentation, and drying techniques, including how to process it into mocaf flour or into fermentation-based products such as pita. The drying process will also be introduced using modern equipment to extend the product's shelf life [1,2,3]. After that, participants were trained in packaging techniques in line with market standards, including vacuum methods and food-grade packaging, and were directed to design attractive, informative packaging to make products more competitive. In closing, participants were equipped with an understanding of production management and food safety, starting from the principles of Good Manufacturing Practices (GMP) to HACCP standards that ensure product quality remains hygienic and safe for consumption [4,5,6] (Figure 2)

3. The next session is digital and offline marketing training. This material aims to equip the public with marketing skills relevant to the digital era, while also addressing offline sales strategies. Participants were introduced to the basic concept of product branding, the importance of building brand identity through logos, packaging design, and product storytelling, and how to determine a competitive pricing strategy based on market segmentation. In the digital realm, they learn to create promotional content, ranging from product photography techniques and writing compelling descriptions to running ads on Facebook and Instagram to expand market reach. In addition, participants were trained to open a business account on the e-marketplace and optimise product visibility.
4. The application of technology, namely the use of graters, dryers, vacuum sealers, and market standard packaging practices. At this stage, participants begin applying the skills they have learned during the training using the technology provided. The main goal of applying this technology is for participants to integrate the knowledge gained into real practice, while improving the productivity and quality of their products. The steps to implement technology are carried out in stages.

First, participants were guided in using modern equipment, such as graters, dryers, and packaging machines, that had been given to the business group. This equipment is expected to speed up the production process while maintaining product quality standards.

Second, a trial of cassava product packaging is conducted to align with market standards. In this stage, participants are invited to explore various packaging designs and branding strategies to increase product appeal to consumers. Third, implementing marketing strategies is an important focus. Participants practice promotion both digitally, including creating business accounts on

social media and uploading promotional content that is relevant to the target market.

Assistance, namely production assistance, digital marketing, and business management. At this stage, assistance is provided to sustain the learning process that participants have undergone. The goal is to ensure that each participant can apply the knowledge gained independently and consistently in the long term. Mentoring is not only technical; it also provides moral encouragement and strategies that help participants become more confident in developing their businesses. This assistance covers several important aspects.

First, digital marketing assistance. Through this activity, participants will be directed to develop online-based promotional strategies so that their products can reach a wider market.

Second, assistance in food technology management, focusing on maintaining production quality standards to ensure processed products remain consistent and comply with food safety principles. Third, production and business management assistance, which helps participants strengthen the production system while fostering collaboration among community members, so that the business runs more solidly and competitively.

In addition, the success of mentoring depends heavily on partners' active participation in the mentoring process. Partners are expected to consult regularly with the service team to address any obstacles immediately. Furthermore, they also need to develop a business strategy based on the guidance provided during the mentoring process. Thus, all stages of this assistance are not only one-way but also collaborative, enabling tangible impact on the sustainability of participants' businesses.

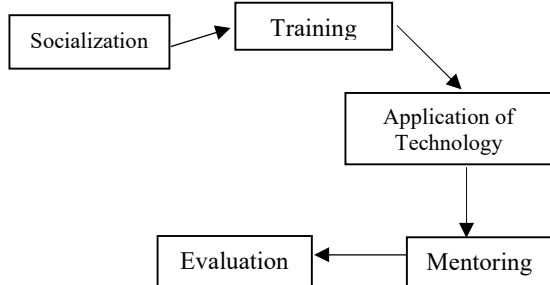


Figure 1. Implementation Method

3. RESULT AND DISCUSSION

The results of the program implementation show several essential achievements that are clearly felt by the community and academics. In terms of production, the community has succeeded in developing new product innovations in the form of cassava chips with sweet-spicy flavor variants and mocaf flour that are processed hygienically. These two products not only add to consumer choice diversity but also increase the value of cassava as a local raw material for sale. Increasing production capacity is also a significant achievement; If previously the community was only able to produce 20 kilograms per day, after technological intervention in the form of the use of modern machines, the capacity increased to 30 kilograms per day. This surge reflects higher efficiency and productivity.

From the aspect of food safety and standardization, the implementation of the principles of Good Manufacturing Practices (GMP) and Hazard Analysis Critical Control Point

(HACCP) is a step forward. With this standard, the products produced are more likely to be clean, thereby meeting the prerequisites for submission of an official distribution permit. This is crucial in increasing consumer confidence while expanding the market, both locally and potentially at the regional level.



Figure 2. Training Activities on Cassava Processing Technology (Ingredient Selection, Fermentation, Drying, GMP & HACCP) and Digital Marketing

On the marketing side, this program has driven digital transformation and strengthened offline sales channels. Business groups now have social media accounts used for promotion and consumer interaction. Their products have also been uploaded to

the marketplace, enabling a wider market reach and avoiding regional limitations. The impact is quite significant, with sales increasing in the first four months after the program began. This aligns with previous research by [7,8,9,10], which emphasised that digital technology support and compliance with product safety standards are crucial factors in increasing MSME competitiveness. Thus, the success of this program is not only practical but also strengthens the academic foundation and provides empirical evidence that an integrated approach combining technology, standardisation, and marketing can promote the sustainability of community businesses.

Furthermore, social and academic impact is also an equally important outcome. For the community, this program fosters confidence and strengthens social ties through joint efforts. Academically, lecturers also benefit by strengthening international collaboration networks that are part of the development of the Tri Dharma of Higher Education.



Figure 3. Training Participants Taking a Group Photo After Completing the Activities

4. CONCLUSION

Based on the goals and results discussed above, the following conclusions can be drawn: This service program is efficacious in improving cassava processing skills and in digital marketing for the Angat Buhay Village community. Increased production capacity, product diversification, and digital market expansion demonstrate that integrating technology and marketing can strengthen the local economy. Based on the above conclusion, the following suggestions can be made: in the future, the program should focus on product certification, branding strengthening, and regional and international market penetration.

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REFERENCE

- [1] Widyanti, E. D., Anggreini, R. A., & Putra, A. Y. T. (2025). Sensory Profiling of Mocaf (Modified Cassava Flour) Cookies with Substitution of Gomphrena globosa L. Powder Using the RATA (Rate-All-That-Apply) Method. *AJARCADE (Asian Journal of Applied Research for Community Development and Empowerment)*, 9(3), 9–13. <https://doi.org/10.29165/ajarcde.v9i3.763>
- [2] Diniyah, N., Iguchi, M., Nanto, M., Yoshino, T., & Subagio, A. (2023). Dynamic rheological, thermal, and structural properties of starch from modified cassava flour (MOCAF) with two cultivars of cassava. *Industria: Jurnal Teknologi dan Manajemen Agroindustri*, 12(1), 89–101. <https://doi.org/10.21776/ub.industria.2023.012.01.8>
- [3] Rasyid, M. I., Maryati, S., Triandita, N., Yuliani, H., & Angraeni, L. (2020). Karakteristik sensori cookies mocaf dengan substitusi tepung labu kuning. *Jurnal Teknologi Pengolahan Pertanian*, 2(1), 1–7. <https://doi.org/10.35308/jtpp.v2i1.2043>
- [4] Hasibuan, S., Kandasamy, J., Purba, H. H., & Jaqin, C. (2025). Green Manufacturing Practices for Improving Sustainability Performance in Packaging Manufacturing MSMEs. *AJARCADE (Asian Journal of Applied Research for Community Development and Empowerment)*, 9(2), 75–80. <https://doi.org/10.29165/ajarcde.v9i2.657>
- [5] P. Astadi, S. Kristina, S. Retno, P. Yahya, and A. Agni Alam, "The long path to achieving green economy performance for micro small medium enterprise," *J. Innov. Entrep.*, vol. 11, no. 1, pp. 1–19, 2022, doi: 10.1186/s13731-022-00209-4.
- [6] S. Choudhary, R. Nayak, M. Dora, N. Mishra, and A. Ghadge, "An integrated lean and green approach for improving sustainability performance: a case study of a packaging manufacturing SME in the U.K.," *Prod. Plan. Control*, vol. 30, no. 5–6, pp. 353–368, 2019, doi: 10.1080/09537287.2018.1501811.
- [7] Indiani, N.L.P., & Fahik, G.A. (2020). Conversion of online purchase intention into actual purchase: the moderating role of transaction security and convenience. *Business: Theory and Practice*, 21(1), 18–29.
- [8] Kusuma, G.A.T., Sapta, I.K.S., Wijana, I.M.D., Tahu, G.P., & Indiani, N.L.P. (2022). Building SMEs' passion for utilising digital media: a study of SMEs during the COVID-19 pandemic. *Forum Scientiae Oeconomia*, 10(3), 151–168.
- [9] Sumartini, A. R., Indiani, N. L. P., Jayanti, L. G. P., S. E. (2023). MSME Empowerment, Stunting Prevention, and Revitalization of Ecotourism Destinations in Penatih Village, East Denpasar District, Denpasar City. *Community Service Journal (CSJ)*, 5(2), 62–68. <https://doi.org/10.22225/csj.5.2.2023.62-68>
- [10] Yamawati, N. K. S., & Indiani, N. L. P. (2023). Strengthening BUMDES, Dengue Fever Control, and MSME Digital Marketing in Marga Dajan Puri Village, Marga District, Tabanan Regency. *Community Service Journal (CSJ)*, 6(1), 28–33. <https://doi.org/10.22225/csj.6.1.2023.28-33>