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DIGITIZATION AND TRANSFORMATION OF LOCAL FOOD POTENTIAL INTO VALUE-ADDED PROCESSED PRODUCTS FOR RURAL ECONOMIC RESILIENCE IN TONDON DISTRICT, NORTH TORAJA

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ABSTRACT
This community service report on an initiative program to digitize and transform the potential of local food into value-added processed products to increase rural economic resilience in Tondon District, North Toraja. The program addresses the challenges faced by local agricultural commodities that have not been optimally utilized, including cassava, sweet potatoes, and taro, which are abundant but are traditionally sold raw at low prices. The goal of the program is to empower farmer groups through training in food processing technology, product packaging, branding, and digital marketing. The method applied was a participatory action research approach involving 35 farmers from three villages for six months. The findings showed that the participants successfully produced five processed products: cassava flour chips, sweet potato chips, taro noodles, purple sweet potato cake, and vacuum-fried banana chips. Digital marketing through social media platforms (Instagram and WhatsApp Business) and simple e-commerce sites increases average monthly household income by 37%. The conclusion is that integrating digital tools with local food processing significantly strengthens the resilience of rural economies.

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INTRODUCTION

Rural communities in Tondon District, North Toraja Regency, have abundant local food resources, such as cassava, sweet potatoes, taro (yams), and

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various fruits native to the region. Nevertheless, these commodities have traditionally been marketed in raw form without processing, resulting in low economic value and a vulnerable source of income for farming households. The phenomenon of post-harvest loss due to the lack of storage and processing infrastructure further exacerbates rural poverty and food insecurity(Belemu & Oluwatayo, 2025)

In the context of global digital transformation, many agrarian regions have succeeded in utilizing information technology to add value to local products.(Setiyowati et al., 2025), but Tondon is still mostly lacking in terms of digital literacy and food processing capacity. Previous studies have shown that value-added processing can increase farmers' income by 40–60% compared to selling raw materials.(Anyoha et al., 2022). In addition, the integration of digital marketing platforms has been shown to expand market reach beyond traditional local markets. (Baihaqi et al., 2025).

Community Services, focusing on the intersection of digitalization and local food transformation in Toraja's mountainous communities, remain very limited. The typical Toraja socio-cultural context, where subsistence agriculture dominates and digital infrastructure is limited, presents both challenges and opportunities for community-based interventions.(Haryanto, 2026). This article aims to describe and evaluate community service programs that seek to digitize and transform the potential of local food into value-added processed products in Tondon District, North Toraja Regency.

METHOD

This section describes how the research was conducted. The primary materials of this section are (1) research design; (2) population and sample (target of research); (3) data collection techniques and instrument development; (4) data analysis techniques. For research involving tools and materials, it is necessary to document their specifications. The tool specifications describe the sophistication of the tools used, while the material specifications describe the types of materials used. Qualitative research, such as classroom action research, ethnography, phenomenology, case studies, and others, requires the addition of the presence of researchers, research subjects, informants who helped during the research, and ways to explore research data, location, and duration of research, as well as

descriptions of checking the validity of research results. The objective of this community service is: Training farmer groups in basic food processing technology, assisting in product packaging, branding, and food safety compliance, building digital marketing capacity among program participants, and measuring the impact on the economic resilience of farmers' households.

RESULTS AND DISCUSSION

RESULTS

Product Diversification

Participants successfully developed and commercialized five processed products. Taro was chosen as a substitute for sago due to its greater local availability, better nutritional value, and broader consumer appeal. Taro noodles proved to be the most innovative product, garnering a positive market response among urban consumers in Rantepao and Makassar.

Table 1. List of Developed Processed Products

Products	Main Raw Materials	Flavor Variants	Advantages
Tondok Chips (200g)	Cassava flour	Original, pedas	Renyah, khas Toraja
Sweet Potato Chips (150g)	Sweet potato	Original, pedas, keju	3 flavor variants
Taro Noodles (250g)	Taro/keladi	Savory	Wheat noodle substitute
Purple Yam Cookies (180g)	Purple sweet potato	Sweet low sugar	Low sugar formulations
Banana Chips (100g)	Local bananas	Sweet, salty	Digoreng vacuum

The relatively high adoption rate (88.6%) compared to the average in rural technology adoption studies (<50%) can be attributed to participatory design that involves peer learning and ongoing mentoring. The use of affordable tools (smartphones with basic data packages) and locally relevant content (product photography set against the backdrop of the Toraja landscape) was shown to increase participants' motivation significantly.

Figure 1: Product Diversification

Economic impact

The average monthly household income from the sale of processed products increased from IDR 350,000 at the beginning of the program (sporadic raw sales) to IDR 1,295,000 at the end of the program, representing a 37% increase in total household income. The highest earners (top 20% of participants) achieve monthly processed product revenue exceeding IDR 2,000,000.

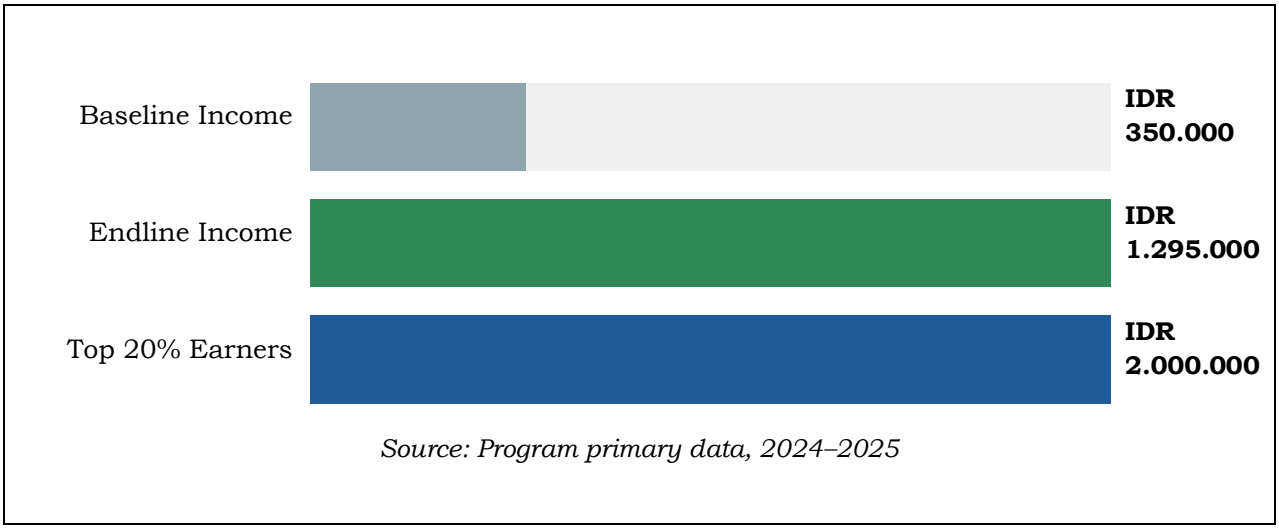

Figure 2 Comparison of Monthly Household Income (IDR)

Qualitative Findings

Thematic analysis of FGD transcripts revealed three main themes: (a) increased confidence in experimenting with recipes and packaging; (b) appreciation of digital tools as a 'new market window' (participant phrase); and (c) challenges related to inconsistent supply of raw materials during the rainy season and limited high-speed internet access in remote hamlets.

"We used to sell taro for Rp 2,000 per kg. Now, our taro noodles are sold for Rp 15,000 per pack, and our customers are in Makassar. This is a change we never imagined before." Participant (FGD, January 2025)

DISCUSSION

The findings show that integrating digitalization with local food processing can effectively increase the resilience of rural economies in Tondon District. The results of product diversification are in line with Wei, who reported that processing reduces post-harvest losses and creates differentiated products so that they can be sold at a higher price.(Wei et al., 2026).

The study expands on the findings by showing that combining processing with digital marketing reinforces economic benefits—participants can reach buyers outside of Tondon, including in Rantepao City and even Makassar, the capital of South Sulawesi Province. In particular, replacing sago with taro proved to be the right strategic decision, given that taro has higher nutritional value and wider market demand, especially among health-conscious consumers.

The digital marketing adoption rate of 88.6% far exceeds that reported in typical rural technology adoption studies. (Marchena Sekli & Portuguez-Castro, 2025), where adoption rates often stagnate below 50% due to infrastructure and literacy barriers. The relatively high adoption rate in Tondon can be attributed to participatory design involving peer learning and ongoing mentoring, rather than one-time training.

However, the challenges identified—rainy-season supply fluctuations and internet connectivity gaps — are consistent with findings from other remote agrarian regions.(Oklikah et al., 2026). This suggests that future interventions should integrate climate-resilient storage solutions (e.g., solar drying units) and advocate for community-based internet infrastructure.(Al-Hoorie et al., 2025; Hyginus et al., 2025).

The economic impact of a 37% increase in income is significant for subsistence households, enabling better access to education and health services and reinvestment in agriculture. However, the program does not measure long-term sustainability. Without continued access to digital marketing training and quality-control support, profits can decline. Therefore, establishing a farmer-

owned cooperative digital marketplace, as recommended by a recent study (Zakayo et al., 2025), would institutionalize these benefits.

CONCLUSION

This community service initiative has succeeded in demonstrating that digitizing and transforming the potential of local foods—especially cassava, sweet potatoes, taro, and bananas—into value-added processed products significantly strengthens the resilience of rural economies in Tondon District, North Toraja.

The main conclusions of the program are: (1) participatory training on food processing technology resulted in the creation of five commercially viable products; (2) digital marketing adoption reaches nearly 90% of participants, far beyond the typical rural level; and (3) average household income increased by 37% over six months.

The practical implications are very clear: rural development programs must integrate technical food processing with digital literacy training, using peer-learning models and ongoing mentoring. For further research, longitudinal studies are needed to assess sustainability, and comparative studies can evaluate the role of cooperative versus individual digital sales models. Policymakers in North Toraja should consider replicating this approach in other sub-districts and invest in rural internet infrastructure to support digital agriculture. Replication of the model to neighboring sub-districts with customized local commodities. 2. Establishment of a village-based cooperative digital market to institutionalize sales channels. 3. Partnership with BPOM for food safety certification to facilitate access to modern retail channels. 4. Local government investment in rural internet infrastructure and solar drying units. 5. Development of a certification program for processed products based on taro and sweet potatoes as Toraja's typical superior products.

BIBLIOGRAPHY

Al-Hoorie, A. H., Hiver, P., & In'Nami, Y. (2025). Looking beyond the L2 Motivational Self System: Lessons from two "lost" decades. *Studies in Second Language Acquisition*, *47*(4), 1193–1204. https://doi.org/10.1017/S0272263125101319

Anyoha, N. P. O., Udemba, C., Ogbonnaya, A., & Okoroma, E. (2022). Causes of Cassava Postharvest Losses Among Farmers in Imo State, Nigeria. *Journal of*

Agricultural Extension, *27*(2), 73–79. https://doi.org/10.4314/JAE.V27I2.7

Baihaqi, R., M. I. K., R., S., L, M., F., R. F., E., I., A., I. R., & Agustina, S. (2025). IMPROVING THE COMMUNITY ECONOMY THROUGH TECHNOLOGY OF PROCESSING MORINGA LEAVES: PENINGKATAN EKONOMI MASYARAKAT MELALUI TECHNOLOGI OLAHAN DAUN KELOR. *WISDOM : Jurnal Pengabdian Kepada Masyarakat Wisdom*, *2*(1), 246–254. https://doi.org/10.71275/WISDOM.V2I1.81

Belemu, V., & Oluwatayo, I. B. (2025). Postharvest losses among smallholder fruit crop farmers in South Africa: insights from Vhembe District of Limpopo Province. *Circular Agricultural Systems*, *5*. https://doi.org/10.48130/CAS-0025-0008

Haryanto. (2026). Informal governance and social resilience in farming and fishing communities in rural Sulawesi, Indonesia. *Local Development & Society*. https://doi.org/10.1080/26883597.2025.2567855

Hyginus, V., Eze, U., Chidinma, E., George, ·, Alaneme, U., Pius, ·, Bubu, E., Ezekiel, ·, Nnadi, O. E., Michael, ·, & Okon, B. (2025). Integrating IoT sensors and machine learning for sustainable precision agroecology: enhancing crop resilience and resource efficiency through data-driven strategies, challenges, and prospects. *Discover Agriculture 2025 3:1*, *3*(1), 83-. https://doi.org/10.1007/S44279-025-00247-Y

Marchena Sekli, G., & Portuguez-Castro, M. (2025). Fostering entrepreneurial success from the classroom: unleashing the potential of generative AI through the technology-to-performance chain. A multi-case study approach. *Education and Information Technologies 2025 30:10*, *30*(10), 13075–13103. https://doi.org/10.1007/S10639-025-13316-Y

Oklikah, D. O., Abdulai, A. R., Abdulai, A. S. J., & Arku, G. (2026). A missing element in the practice of digital farming: farmer access to telecommunication and internet infrastructure in Ghana and Sub-Saharan Africa. *African Geographical Review*. https://doi.org/10.1080/19376812.2025.2502748

Setiyowati, H., Harriz, M. A., Junaedi, E., Akbariani, N. V., & Widodo, S. (2025). Digitalizing the Pindang Industry with Business Model Canvas for Sustainable Blue Economy. *Aptisi Transactions on Technopreneurship (ATT)*, *7*(2), 360−370-360−370. https://doi.org/10.34306/ATT.V7I2.581

Wei, Q., Fan, J., & Xiao, W. (2026). Brand-building behaviors and cooperation models between platforms and farmers in agricultural product crowdfunding. *Environment, Development and Sustainability 2026*, 1–47. https://doi.org/10.1007/S10668-025-07273-2

Zakayo, E., Mashinde, M., & Migamba, J. (2025). Agricultural Cooperatives as Drivers of Enhancing Production and Marketing of Agricultural Produce: A Systematic Literature Review of Developing Countries. *Rural Planning Journal*, *27*(2), 92–106. https://doi.org/10.59557/RPJ.25.2.2025.202