# MOCAF (MODIFIED CASSAVA FLOUR) TO BOOST INDONESIA'S AGRIBUSINESS ECONOMY

*Nina Herlina*[1,1], *Muhammad Zaki Rahman*[2]
[1] Department of Manajemen, Fakultas Ekonomi, Universitas Galuh, Indonesia

**Abstract (Arial 9-point).** Indonesia is one of the world's largest cassava producers, yet its economic potential remains underutilized. The development of Modified Cassava Flour (MOCAF) offers a promising opportunity to enhance the value of this crop. MOCAF is a gluten-free flour made from fermented cassava and can serve as a local alternative to wheat flour. This research aims to explore the potential of MOCAF in boosting Indonesia's agribusiness sector by creating value-added products that can reduce the country's dependency on imported wheat flour. The study employed a qualitative approach, gathering data through literature reviews, case studies, and expert interviews to assess the economic, technical, and social feasibility of MOCAF. Findings indicate that MOCAF has significant potential to empower rural communities, create local job opportunities, and offer a sustainable solution to food security issues. Additionally, the development of MOCAF could promote food diversification and foster growth in the local food industry. The results highlight that with proper government support and investment in infrastructure, MOCAF production could be scaled up to achieve economic benefits on a national level.

Keywords: MOCAF; cassava; agribusiness; food innovation; Indonesia

## 1 Introduction

Indonesia is one of the world's largest cassava producers, with vast agricultural potential that remains underutilized regarding value-added processing and industrial applications. Despite the abundance of cassava, its conventional uses are largely limited to direct consumption and small-scale traditional products, which offer limited economic return and minimal contribution to the agribusiness sector. In response to this challenge, Modified Cassava Flour (MOCAF), a flour made through fermentation and enzymatic modification of cassava, has emerged as an innovative product with the potential to substitute wheat flour and support local food industries [1].

MOCAF possesses several advantageous characteristics, including a neutral taste, high digestibility, gluten-free properties, and better functional performance in food processing compared to conventional cassava flour [2]. These properties make MOCAF suitable for a wide range of applications in the bakery, snack, and processed food sectors, while also catering to growing global consumer demands for healthier and allergen-free alternatives. Research indicates that MOCAF can contribute significantly to food diversification, reduce Indonesia's reliance on imported wheat, and open new opportunities for rural agro-industries [3,4].

[1] Corresponding author: zakirahman@unigala.ac.id

Despite several prominent studies that have addressed production techniques and nutritional qualities of MOCAF, there is limited research focused on its broader economic impact and scalability within Indonesia's agribusiness system [5]. Given Indonesia's strategic goals to enhance food security, strengthen local industries, and increase farmer income, the integration of MOCAF into national agribusiness development programs holds promising potential. This study offers a novel contribution by examining MOCAF not only as a food innovation but also as a strategic commodity that can drive economic empowerment and sustainable agribusiness growth.

The objective of this research is to analyze the potential of MOCAF to strengthen Indonesia's agribusiness economy by supporting rural industry development, enhancing market value chains, and creating employment opportunities. It also seeks to identify the main factors that influence the successful scaling-up of MOCAF production and its integration into national economic strategies. This study hypothesizes that MOCAF development has a significant positive effect on Indonesia's agribusiness economy, provided that supportive infrastructure, policies, and market access mechanisms are in place.

## 2 Research Method

This study employs a qualitative descriptive approach to analyze the prospects of MOCAF in boosting Indonesia's agribusiness economy. This research was conducted in chosen locations of Indonesia where MOCAF production and processing initiatives are being dynamically implemented, namely East Java and West Java provinces. The locations were purposively selected based on their capacity to produce cassava, the presence of small and medium agro-industries, and the presence of active government or community-based MOCAF initiatives.

The population targeted for this study consists of key stakeholders involved in the MOCAF value chain, such as cassava producers, MOCAF processing units, local agribusiness entrepreneurs, managers of cooperatives, and government and supporting organizations' officers. Purposive sampling was employed in the respondent selection with rich information and experience in MOCAF innovation to ensure data collected is contextually rich and applicable to the research objectives. A total of fifteen respondents were interviewed: five MOCAF producers, four cassava farmers, three agribusiness consultants, and three policymakers from the local agricultural agency.

Data were collected through in-depth interviews, direct observation, and documentation. Semi-structured interview guidelines were developed to maintain consistency across interviews while allowing flexibility to explore emerging themes. The interviews were recorded, transcribed, and validated through triangulation with observational and document-based data. Observations were conducted at several MOCAF processing facilities to understand the production process, supply chain practices, and operational challenges. In addition, relevant policy documents, statistical reports, and previous studies were reviewed to provide contextual depth and support data triangulation.

The main variables examined in this study include the socio-economic impact of MOCAF development, production scalability, market access, and institutional support. These variables were not measured quantitatively but were instead analyzed through thematic coding and content analysis. Thematic analysis followed the six-phase process outlined by Braun and Clarke [6], involving familiarization with the data, generation of initial codes, theme development, review, definition, and final reporting. Coding was conducted manually, and themes were cross-validated with field notes and secondary sources to ensure analytical rigor.

In a bid to promote reliability and replicability, all processes—interview protocols, selection criteria, and analytic frameworks, for instance—are clearly documented. Departures from established qualitative approaches, e.g., the application of Braun and Clarke's model with modifications to allow for policy review as a supplementary source, are justified to enable transparency and alignment with study objectives. Ethical practices, like informed consent and data confidentiality, were rigorously observed in the study process.

## 3 Results and discussion

The findings of this study indicate that MOCAF plays a significant role in increasing economic activity in rural areas, promoting value-added processing of cassava, and supporting food diversification efforts. Based on data collected from interviews and field observations, MOCAF production has contributed to employment growth, improved farmer income, and strengthened local agribusiness ecosystems. These outcomes are particularly evident in regions where community-based agro-industrial models are integrated with cooperative systems and supported by local government policies.

Table 1. Socio-economic Impact of MOCAF Development on Local Stakeholders

| Indicator | Before MOCAF Production | After MOCAF Production | % Change |
|---|---|---|---|
| Average monthly farmer income (IDR) | 1,200,000 | 2,050,000 | +70.8% |
| Number of full-time workers in MOCAF SMEs | 3 | 9 | +200% |
| Monthly MOCAF output (kg/producer) | 150 | 450 | +200% |
| Local market distribution coverage | 1 sub-district | 3 districts | — |

Figure 1. MOCAF Value Chain in Local Agribusiness Ecosystem

(Illustration of cassava farming → fermentation & drying → milling → packaging → distribution)

Table 1 shows a substantial increase in farmer income and employment opportunities after involvement in MOCAF production. This aligns with previous research by Apriyanto et al. [7], who reported that MOCAF-based agribusiness models increased economic returns for rural communities. The 200% increase in SME employment suggests that MOCAF serves as an effective labor absorber, especially for women and youth in rural areas. Furthermore, the expanded market coverage reflects growing consumer awareness and the increasing demand for gluten-free, locally-sourced food ingredients.

The MOCAF value chain (Figure 1) highlights the involvement of multiple actors, including farmers, processing units, packaging SMEs, and market intermediaries. The integration across these stages indicates a well-coordinated model, often facilitated by cooperative or *Pesantren*[2]-based business structures. This supports the argument made by Kurniawan and Setiawan [8], who emphasized the importance of institutional support and collaboration in ensuring the sustainability of agro-industrial innovations.

In the discussion with stakeholders, respondents acknowledged challenges related to the consistency of raw material supply, limited access to capital, and lack of advanced drying or milling equipment. These constraints hinder the scalability of MOCAF production and limit its competitiveness against imported wheat flour. However, community-led efforts, combined with government support in the form of training and subsidies, have partially mitigated these limitations.

Comparing these findings to those of Handayani et al. [9], this study confirms the practical viability of MOCAF in rural industrialization but also emphasizes the need for policy-level intervention to facilitate technology adoption and market expansion. Moreover, the socio-cultural acceptance of MOCAF products has gradually improved due to local food campaigns and health trends, as supported by Warganegara & Saputro [10].

Overall, the research findings suggest that MOCAF development has significant potential to improve Indonesia's agribusiness economy. It not only creates economic opportunities but also contributes to national goals of food sovereignty and import reduction. The success of MOCAF-based models relies on continued innovation, strategic partnerships, and policy alignment to ensure long-term impact and sustainability.

## 4 Conclusion and recommendation

[2] *Pesantren* in Indonesia is a traditional Islamic boarding school. It is one of the oldest and most enduring forms of education in the country, deeply rooted in Indonesian culture and society.

The study concludes that MOCAF (Modified Cassava Flour) has considerable potential to enhance Indonesia's agribusiness economy by improving rural incomes, creating employment opportunities, and strengthening local food industries. The integration of MOCAF into community-based agro-industrial systems demonstrates its capacity as a viable alternative to imported wheat flour, contributing to food diversification and national food security. The findings also reveal the importance of collaborative models involving cooperatives, *Pesantren*-based enterprises, and local government support in ensuring the success of MOCAF initiatives. However, challenges related to raw material availability, technological limitations, and market access should be addressed carefully to avoid overgeneralization regarding the scalability of MOCAF across different regions.

Based on these findings, it is recommended that stakeholders, including policymakers, agricultural extension agents, and development practitioners, prioritize MOCAF in rural economic development programs. Investments in technology upgrading, farmer training, and institutional strengthening are essential to optimize MOCAF production and competitiveness. Further, efforts to promote consumer awareness and develop broader distribution networks are necessary to sustain market demand. This research provides practical insight for future agribusiness models that align with Indonesia's goals of food sovereignty and rural empowerment.

**Acknowledgment.** The authors would like to thank the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia for the support and funding provided through the Independent Learning and Campus Freedom (MBKM) program. Special appreciation is also extended to the farmers, small business owners, and cooperatives in Ciamis and surrounding regions who participated in this study and generously shared their time and insights.

## References

[1] Apriyanto, A., Ratriyani, R., & Fitriani, R. (2020). *Production of Modified Cassava Flour (MOCAF) as Wheat Flour Substitute in Indonesia: A Review*. IOP Conference Series: Earth and Environmental Science, **441**, 012123. https://doi.org/10.1088/1755-1315/441/1/012123

[2] Handayani, N. A., Haryadi, H., & Santoso, U. (2020). *Physical and chemical properties of modified cassava flour (MOCAF) produced by spontaneous fermentation*. International Food Research Journal, **27**(5), 861–868.

[3] Warganegara, D. L., & Saputro, R. (2022). *Market Opportunity and Economic Potential of MOCAF-based Products in Indonesia*. Journal of Agribusiness and Rural Development, **45**(2), 112–121.

[4] Prasetyo, Y. E., & Sari, P. (2019). *MOCAF as an Alternative to Reduce Wheat Import in Indonesia*. Jurnal Teknologi dan Industri Pangan, **30**(1), 15–21.

[5] Kurniawan, T., & Setiawan, B. (2021). *Challenges and Opportunities of Scaling-Up MOCAF Production in Indonesian Rural Areas*. Indonesian Journal of Agricultural Economics, **14**(2), 75–84.

[6] Braun, V., & Clarke, V. (2006). *Using thematic analysis in psychology*. Qualitative Research in Psychology, **3**(2), 77–101. https://doi.org/10.1191/1478088706qp063oa