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Development of Taro Agribusiness Using Local Wisdom: a Swot Analysis to Promote Sustainable Food Security

Anang Triyoso[1], Indah Prihartini[2], Anas Tain[3], Endang Gunaisah[4]
[1,2,3]University Muhammadiyah Malang, Indonesia
[4]Politeknik Kelautan dan Perikanan Sorong, Indonesia
Email: anangtriyoso@unimudasorong.ac.id, prihartini@umm.ac.id, anas@umm.ac.id, endanggunaisah@polikpsorong.ac.id

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ABSTRACT

Taro shows promising agribusiness prospects as a local commodity that supports sustainable food security, but these efforts are still overshadowed by various obstacles that require the right handling strategy. The purpose of this research is to identify internal and external factors and develop a strategy for the development of taro agribusiness based on local wisdom in West Papua. This research uses a mixed-method design by combining surveys of 50 key informants, in-depth interviews, FGDs, observations, and SWOT analysis. The results of the study show the following factors: 1. Strengths include the availability of local seed varieties, suitable agroclimatic conditions, extensive land ownership, farming experience, and the position of taro as a local food for the community; 2. Weaknesses include limited production facilities, low financial capacity of farmers, simple processing technology, high transportation costs, and weak farmer institutions; 3. Opportunities include increasing market demand, support for regional autonomy, strategic production centers, and scientific and technological advances; and 4. Threats include low purchasing power, a high rate of product damage, weak legal certainty on land, land conversion, and competition with taro products from outside the region. This study concludes with a strategy that prioritizes strengthening production capacity, expanding market access, diversifying processed products through innovation, developing agroindustry, strengthening farmer institutions, improving production facilities, and implementing price regulation policies. The development of taro agribusiness requires a comprehensive strategy that integrates local wisdom to increase sustainable food security in West Papua.

INTRODUCTION

Food security is now seen as one of the global strategic issues that demands serious attention in this modern era. The projected population of up to 9–10 billion people by 2050 is expected to significantly increase the world's food needs, while climate change exacerbates vulnerability through extreme weather events such as droughts, floods, and heat waves (Hussain et al., 2025; Kaiser, 2023; Shamshad et al., 2024; Vidanagamachchi et al., 2024), soil degradation (Lal, 2013), and greenhouse gas emissions (Knorr et al., 2023). This multidimensional pressure is driving the United Nations (UN), through the Sustainable Development Goals (SDGs), in particular Objective 2 (*Zero Hunger*), emphasizing the urgency of building an inclusive, sustainable, and diverse food system (T. Sharma et al., 2024). This puts food security at the top of international policy (Gouvea et al., 2022; Wahbeh et al., 2022). Therefore, mapping the determinants of food security and developing integrated strategies are crucial to ensure the sustainability of future food systems that link local actions with global sustainability.

The Government of Indonesia encourages food diversification as a strategic effort to reduce dependence on rice and strengthen sustainable food security. Food diversification plays an important role in improving food security systems, preserving biodiversity, and driving the zero hunger agenda (Javid et al., 2025). Food diversification increases farmers' planting intensity, production yield, and income while maintaining sustainability (Emran et al., 2022) and keeping the soil fertile, nutrients flowing, and more resilient to climate change (Danso-Abbeam et al., 2025; He et al., 2023). Even so, obstacles remain, such as the old policy of a lack of partisanship, a lack of funding, and market competition (Nandi et al., 2024). Food diversification through policy support and agribusiness development is a key strategy to reduce dependency and build a better food system.

West Papua has its own peculiarities in food diversification efforts, thanks to its biodiversity and traditional food system, where taro is an important part of the daily diet and cultural life of the local community. Taro (*Colocasia esculenta*) has long been a traditional staple food in West Papua, which is integrated with local wisdom through cultural knowledge and traditions (Arafah, 2023; Azis et al., 2025; Matthews et al., 2017). Taro is a symbol of resilience and identity awakening, which is reflected through the practice of cultivating and processing it as a food source (Aikau et al., 2016). Taro cultivation not only provides an important source of nutrients (Chauhan et al., 2024; Grimaldi et al., 2018), but also strengthens food security by supplementing other local food sources, such as sago, which communities see as an important part of culture and food security (Sidiq et al., 2022).

Local wisdom plays a pivotal role in shaping taro cultivation practices and agribusiness development in West Papua. Traditional agricultural knowledge, passed down through generations, encompasses sophisticated understanding of crop rotation patterns, intercropping systems, and natural resource management that have sustained taro production for centuries. Indigenous communities in West Papua have developed culturally embedded practices such as the *kebun campur* (mixed garden) system, where taro is cultivated alongside other crops in a manner that mimics natural forest ecosystems, thereby maintaining soil fertility and biodiversity. Traditional cultivation methods include the use of organic materials for soil enrichment, community-based seed selection and preservation systems, and culturally prescribed planting and harvesting calendars aligned with environmental cycles. These practices not only ensure ecological sustainability but also reinforce social cohesion through collective labor arrangements known as *gotong royong*. Furthermore, indigenous food processing techniques, such as traditional fermentation and preservation methods, add value to taro products while maintaining nutritional quality. The integration of these time-tested practices with modern agribusiness approaches offers a unique pathway to sustainable food security, as local wisdom provides resilience against climate variability, reduces dependence on external inputs, and preserves cultural identity. This symbiosis between traditional knowledge and contemporary agricultural development distinguishes West Papua's taro agribusiness from conventional commodity-based approaches and forms the conceptual foundation for this study's exploration of sustainable development strategies.

Research results have shown the important role of taro cultivation in community life. Traditional taro cultivation practices combined with intercropping patterns can increase farmers' income while providing important economic value (Maretta et al., 2022). Findings show that taro production can be done in an environmentally friendly manner if it is based on traditional practices (Alexandra et al., 2020; Yamanouchi et al., 2022). The application of taro cultivation in agroforestry and wetlands has an impact on soil fertility, forest balance, and biodiversity, while bringing challenges and opportunities for conservation (Juang et al., 2021). Research related to taro by-products shows the presence of bioactive phytochemicals with nutritional and medical benefits (R. Sharma et al., 2025). Thus, taro is not only culturally and

nutritionally important, but also has economic and sustainability implications for the indigenous peoples of West Papua.

So far, there has been no research that comprehensively applies SWOT analysis to taro agribusiness based on local wisdom in West Papua. Although taro shows potential as a local commodity that supports food diversification, an empirical understanding of the strengths and weaknesses of taro agribusiness based on local wisdom in West Papua does not exist. West Papua itself is still very dependent on rice; on the other hand, it is recorded to have a relatively prominent taro consumption of 10.8 kg/capita/year (BPS, 2023). This shows the socio-cultural basis that can be the capital for the development of taro agribusiness. West Papua is supported by the potential area of plantation land, which reaches 3,208.91 hectares (BPS, 2019). Similarly, systematic studies that map the external opportunities (e.g., market access, value chains, institutions, local/national policies) and threats (e.g., land conversion, climate change, consumption stigma) to taro agribusiness do not exist. The threat of oil palm plantation expansion causes socio-economic vulnerability and conflicts related to land access and community income diversification (Sagrim et al., 2025). Therefore, a SWOT study that combines quantitative (production, consumption, land area) and qualitative data (local wisdom, consumer preferences, institutions) is an important step to fill the evidence gap and formulate a real and sustainable taro agribusiness development strategy in West Papua.

This study seeks to fill the gap in previous research through the application of SWOT analysis in evaluating the potential for taro agribusiness development based on local wisdom in West Papua. SWOT analysis is usually used to identify various internal and external factors that determine the sustainability of agribusiness (Paschalidou et al., 2018). In line with the importance of this issue, this study aims to: first, identify SWOT factors in taro agribusiness based on local wisdom in West Papua; second, formulate and determine alternative strategies for the development of taro agribusiness based on local wisdom in West Papua. Thus, this research contributes academically by addressing existing literature gaps, while also making practical contributions in the form of policy recommendations to strengthen food diversification, reduce dependence on rice, and align local food systems with national and global agendas towards sustainable food security.

METHOD

The research was conducted in West Papua Province, identified as having significant potential for increasing taro production (BKP, 2020). Three districts—Maybrat Regency, Sorong Regency, and South Sorong Regency—were selected purposively. These districts are the main taro production centers in West Papua and maintain traditional taro cultivation practices and local wisdom, making them suitable for studying indigenous knowledge integration with agribusiness development. The districts also present diverse geographical and agroclimatic conditions, from lowland to highland ecosystems, enabling a thorough assessment of taro agribusiness potential. Consultations with provincial agricultural authorities and community leaders confirmed active taro farming communities with established market links and typical regional production challenges and opportunities.

Research subjects and sample size were determined through a multi-stage process. Purposive sampling identified key informants with critical knowledge and decision-making roles in taro agribusiness, based on criteria including at least five years of involvement in taro production, processing or trade; recognized leadership or expertise in the taro value chain; willingness to provide comprehensive information; and representation from diverse stakeholder groups. Initial informants were identified via district agricultural offices, farmer associations, and community leaders. Fifty key informants were selected: 27 taro farmers of various scales, 6 traders, 3 taro processing agro-industry units, and 14 government representatives from agricultural sectors.

To broaden the informant pool, snowball sampling was used, allowing identification of additional actors beyond formal channels. Initial informants referred others who met selection criteria. This process continued until no new significant information emerged, capturing a wide range of stakeholders including informal traders and traditional leaders. The combination of purposive and snowball sampling ensured strategic selection and comprehensive representation of West Papua's taro agribusiness ecosystem.

Data collection integrated quantitative and qualitative methods. The quantitative part involved structured surveys of farmers, agribusiness actors, and local government to gather data on taro agribusiness, regulations, local wisdom, and perceptions of internal and external factors. The qualitative part included participatory observation, in-depth interviews, and focus group discussions with traditional leaders, extension workers, agroindustry actors, and government officials.

Data analysis aimed to identify SWOT factors influencing taro agribusiness based on local wisdom and to formulate strategies supporting sustainable food security. Quantitative survey data were analyzed descriptively to reveal strengths, weaknesses, opportunities, and threats. Qualitative data were thematically analyzed to validate and deepen the understanding of these factors by triangulating sources and methods.

Using identified SWOT factors, a strategy matrix was developed in four categories: SO (strengths-opportunities), WO (weaknesses-opportunities), ST (strengths-threats), and WT (weaknesses-threats). These strategies were validated through stakeholder discussions to ensure they were context-specific, feasible, aligned with local wisdom, and supportive of strengthening taro agribusiness and sustainable food security in West Papua.

RESULT AND DISCUSSION

Identification of Internal Factors

The internal factor identification process aims to assess the extent to which strengths and weaknesses play a role in influencing the ability of taro agribusiness to achieve development goals. By clearly identifying these two aspects, related parties can design the right strategy to leverage strengths while overcoming weaknesses so that taro agribusiness development can run more effectively, efficiently, and sustainably. The results of these findings are then summarized in the following table.

Table 1. Internal Aspects of Taro Agribusiness Development

Internal Aspects	
Strength	**Weakness**
1. Labor Availability	1. Availability of production facilities
2. Availability of local seeds	2. Farmers' financial ability
3. Agroclimatic suitability	3. Processing of taro products
4. Land area owned	4. Taro marketing risk levels and costs
5. Farming experience	5. Product price level
6. Taro productivity	6. Availability of cooperatives
7. Quality and quantity of taro products	

Source: Primary Data, processed by researchers

The table above illustrates the internal aspects that affect the potential development of taro agribusiness in West Papua, including strengths and weaknesses. The results of the identification show that there are seven strengths and six weaknesses as internal aspects of taro agribusiness development in West Papua. The development of taro agribusiness in West Papua has considerable potential, thanks to the strengths of farmers and supportive agronomic conditions. However, some weaknesses need to be overcome through strategic interventions so that the development of taro agribusiness can run optimally, sustainably, and provide greater economic benefits for the community.

Identification of External Factors

The external factor identification process aims to uncover the opportunities and threats faced by the development of taro agribusiness in West Papua, as shown in the following table.

Table 2. External Aspects of Taro Agribusiness Development

External Aspects	
Opportunities	***Threats***
1. Demand level of taro products	1. Taro price instability
2. The era of globalization expands the marketing of taro products	2. Seed availability
3. Support for regional autonomy	3. The legal force of land allocation and control is unclear
4. Strategic function as a taro production center development area	4. Land Use Conversion
5. Science and Technology Development	5. Competition for the sale of taro products with outdoor taro products

Source: Primary Data, processed by researchers

The table above illustrates the external factors that affect the potential development of taro agribusiness in West Papua, which include opportunities and threats. The identification results showed that there were five opportunity factors and five threat factors.

Taro Agribusiness Development Strategy Matrix

The application of the SWOT matrix provides a comprehensive overview of the relationship between external opportunities and threats and internal strengths and weaknesses, making it easier to determine taro agribusiness development strategies based on local wisdom. The results of the formulation of the four strategies are presented in the following table.

Table 3. Swot Matrix Taro Agribusiness Development Strategy Based on Local Wisdom in West Papua

INTERNAL / EXTERNAL	**Strength (S)**	**Weakness (W)**
	1. The availability of local seeds is still dominant 2. Agroclimatic suitability 3. The area of land owned by farmers 4. Farming experience 5. Taro productivity 6. Quality and quantity of taro products 7. Local food community	1. Lack of availability of production facilities 2. Farmers' financial ability 3. Processing of simple taro products 4. The cost of transportation from the production center is relatively high 5. Product price level 6. Farmer groups and taro cooperatives do not yet exist
Opportunity (O)	**S-O**	**W-O**

1. Potential demand for taro products 2. The era of globalization expands the marketing of taro products 3. Support for regional autonomy 4. Strategic function as a taro production center development area **5.** Science and Technology Development	1. Increase in taro production capacity (S-1, S-2, S-3, S-4, S-5, S-6, S-7, O-1, O-2, O-3, O-4, O-5) 2. Expand marketing access (S-5, S-6, S-7, O-1, O-2, O-3, O-4, O-5) 3. Development of taro processed products (S-4, S-5, S-6, O-1, O-2, O-3, O-4, O-5)	1. Providing production facilities to support farming (W-1, O-1, O-3, O-4, O-5) 2. Establishing Cooperation with Capital Institutions (W-2, W-4, W-5, W-6, O-1, O-3, O-4) 3. Forming a taro farmer group (W2, W3, W5, W6, O1, O4)
Threat (T)	**S-T**	**W-T**
1. Purchasing power of the community 2. The risk of taro products is relatively high 3. The legal force of land allocation and control is unclear 4. Land Use Conversion 5. Competition in the sale of taro products with taro products outside West Papua	1. Increasing the capacity of farmers (S-4, S-5, S-6, T-1, T-2) 2. Forming a special area for taro cultivation (S-2, S-3, T-3, T-4, T-5)	1. Development of taro processing agroindustry (W-3, W-4, T-1, T-2, T-5) 2. Price regulations set by local governments (W-2, W-4, W-5, T-1, T-2, T-5) 3. Application of technological innovation to drive the competitive advantage of taro (W-1, W-3, T-2)

The SWOT matrix analysis, which illustrates the potential for developing taro agribusiness based on local wisdom in West Papua Province, reveals several strategies that can be designed as described below.

S-O Strategy

An S-O strategy is an approach that leverages internal strengths to take advantage of external opportunities. From the results of the analysis, three strategies were found that were recommended to be implemented in the study area.

Strategies to increase the production capacity of Taro

The proposed strategy is to increase taro production. This condition is due to the use of local seeds by farmers, which are available in abundance with a variety of cultivars and are supported by an agroclimatic environment suitable for the widespread development of taro. Taro production can increase in line with the increase in the area of agricultural land owned by farmers; the more land owned, the higher the production yield and income obtained. Armed with farming experience and local knowledge inherited from generation to generation, taro productivity is relatively high. The existence of regular consumers, such as the local food needs of the Papuan people and agro-industrial raw materials, also ensures the absorption of taro farming products. Based on existing opportunities, the demand for taro products is relatively high because people use taro as a food ingredient and processed taro that provides added value.

Strategies to expand marketing access

The high productivity and good quality of taro products are in great demand by consumers, particularly for meeting the needs of local food that holds historical and cultural value deeply rooted in West Papua. This situation can certainly be the basis for expanding the existing marketing reach. Another strategic step is to expand the marketing network beyond its current focus on local taro cultivation sites, represented by sales huts. Even if it reaches the primary market, it remains challenging to connect with consumers.

Taro Processed Product Development Strategy

The strategy for developing taro-based processed products through the optimization of internal strength and market share opportunities is currently ongoing. Farming experience and local knowledge of taro processing, passed down through generations, provide a solid foundation for taro product innovation. This, in turn, lays a strong groundwork for the development of taro-processed products, including taro flour, chips, and other snacks. Excellent opportunities also come from market trends that are increasingly leading to healthy and natural food consumption. Taro, with its high fiber content and gluten-free status, has the potential to attract consumers looking for healthier food alternatives. Government policy support that encourages local food diversification and potential partnerships with the food industry can further strengthen this strategy, making processed taro products one of the flagship products of West Papua.

W-O Strategy

The W-O strategy is a strategy that utilizes the available opportunities as effectively as possible to minimize existing weaknesses. Alternatives to the implementation of the W-O strategy can be described as follows.

Providing production facilities to support farming

One of the main weaknesses in taro cultivation in West Papua is the limited access of farmers to agricultural tools and technology. Many farmers still rely on traditional methods, which tend to be less efficient than selecting large areas of land. As a result, production results are less than optimal, impacting the ability to meet high consumer demand, especially in cities. Opportunities to improve these conditions come from various government programs and other institutions that focus on the development of local agriculture. The provision of more adequate facilities will not only encourage taro productivity but also play a role in maintaining the quality of the taro produced.

Establishing cooperation with capital institutions

One of the recommended strategies is to cooperate with capital institutions. This is due to limited access to capital to manage taro farming, as well as low incomes. Hence, farmers and agroindustry actors often depend on limited and expensive sources of funds, such as informal loans. This limited capital is a significant obstacle to the sustainable development of taro farming businesses. An excellent opportunity to address this weakness comes from various government programs and initiatives that support access to capital for farmers, as well as interest from financial institutions to get involved in the agricultural sector.

Strategies to form farmer groups

The formation of farmer groups is one of the recommended strategies, because through this forum, farmers have greater bargaining power and can make joint decisions before marketing taro. Given that there are no farmer groups focused on taro commodities at the research site, forming a taro farmer group is the right step. Overall, this strategy not only strengthens the economic position of taro farmers but also fosters solidarity and collaboration among them, creating a more resilient and self-reliant community that can overcome various obstacles while optimizing available opportunities.

S-T Strategy

The S–T strategy is an effort to utilize internal power to minimize or avoid external threats. Some alternative S–T strategies that can be formulated are as follows.

Increasing the capacity of taro farmers

Efforts to strengthen the capacity of taro farmers can be initiated by leveraging the potential that has been developed so far, namely, farming experience, local knowledge, and traditional skills in cultivating taro. Taro farmers in West Papua are known to have long experience cultivating taro with cultivation techniques that have been proven to be suitable and adequate for local conditions. Capacity building through training and education can help farmers maximize existing techniques, become familiar with new technologies, and produce more and higher-quality crops. However, this strategy also faces threats that need to be watched out for, such as the possibility of resistance to change and farmers' limited access to technology. The best way to address this threat is to involve farmers from the beginning in the planning and implementation process of training, accompanied by ongoing technical assistance, so that changes can take place gradually and according to the needs on the ground.

Establishment of a special area for taro cultivation

West Papua has fertile soil and a supportive climate, making it perfect for taro growth. This potential can be more optimal if there is a special area focused on taro cultivation, as has been done by the local government of Sorong Regency in Klawak district and its surroundings. The development of well-organized areas will help farmers take advantage of economies of scale, ranging from the use of shared agricultural tools, easy access to supporting infrastructure such as irrigation and roads, to more regular management. However, some threats must be anticipated, such as the possibility of legal disputes around land rights and land use shifts that could cause problems in the future. The most appropriate way to address these challenges requires the joint work of all relevant stakeholders, especially local communities and local governments, to participate in designing and implementing special areas, while developing a comprehensive plan to anticipate the impacts of climate change.

W-T Strategy

The W-T strategy aims to minimize existing weaknesses to better avoid or face threats from outside. This approach tends to be defensive with a focus on risk reduction.

Development of processed taro agroindustry

Taro processing in West Papua is generally still done with simple technology, which makes production less consistent and efficiency limited. The limitations of available technology significantly hinder the ability to produce competitive taro processed products in the market. Solutions to these weaknesses can be achieved through the provision of the latest processing technology and assistance for operators so that production results are more optimal. In addition, the construction and renewal of taro processing facilities is an important step to increase production capacity without sacrificing product quality. Even so, this strategy cannot be separated from threats that need to be watched out for, such as the rise and fall of people's purchasing power and risks related to taro products. Competition from substitute products, both from outside and processed taro from other regions, also has the potential to narrow the existing market position. Facing these threats, strategic steps can be taken through comprehensive market research, product diversification development, and opportunity mapping in untapped market niches. In addition, sound risk management, including long-term cooperation with supplier partners as well as buyers, will help maintain the position of taro in the market.

Price regulations set by local governments

The difference in price and product quality can weaken the competitiveness of West Papuan taro in the market, which ultimately reduces demand and harms the income of local farmers. Local governments should establish price rules that not only safeguard the interests of

local farmers but also promote taro production with higher quality and efficiency. Taro products from outside the region are sold at a price of about 30% cheaper than local taro, due to their lower production costs or government subsidies that are not available for local taro. This threat can be overcome by local governments that actively promote innovation and production efficiency, including providing support or incentives so that farmers are willing to apply the latest technology and efficient farming methods. In addition, support in the form of promotion and marketing of local taro products is needed so that their appeal increases and their image is stronger in the market.

Technological innovation strategy to drive taro's competitive advantage

The strategy of technological innovation in taro development should begin by improving various weaknesses that still exist in the current production process, so that competitiveness can increase. The use of traditional production tools and inefficient methods is still widely encountered among taro farmers and processors in West Papua. As a result, product quality is not always maintained, and its competitiveness decreases when faced with a competitive market. This strategy needs to consider risks that can affect taro production yields, such as plant disease attacks and the impact of climate change. To mitigate these threats, it is important to adopt technologies that not only make processes more efficient but also help in risk management.

Based on a combination of strengths, weaknesses, opportunities, and threats, the main strategies that can be applied are increasing production and farmer capacity, expanding marketing access, and diversifying taro processed products based on technological innovation. Agribusiness transformation has become a driver of agricultural growth and food security, both in the production and marketing processes (Gandhi, 2014). Local wisdom not only helps strengthen the capacity of farmers (Boripis et al., 2024), but also improves adaptability to climate change (Kephe et al., 2020). Sustainable practices such as crop rotation, agroforestry, and tillage also support increased productivity while preserving the environment (Bi et al., 2024). Taro farmers also face urgent needs, ranging from processing technology training, access to credit, pest control, and marketing, so a comprehensive form of support is needed (Kufre et al., 2021).

Innovation in agriculture comes as a solution that not only overcomes production barriers, but also helps increase the work effectiveness of taro farmers (Gomez-Torres et al., 2020; Thiranagama et al., 2024). Mechanical harvesting technologies, such as centrifugal rotation-based tuber separators, have now been developed to help improve efficiency in taro production (Liu et al., 2024). In addition, the use of environmentally friendly technology packages has been proven to be able to encourage improved economic performance while maintaining sustainability in agribusiness management (Mariyono, 2020).

In addition, the sustainability of taro agribusiness can be strengthened through the development of processing agro-industries, strengthening farmer groups and cooperatives, providing adequate production facilities, and government support in price regulation. Institutional strengthening plays an important role in increasing the competitiveness of farmers. This effort not only facilitates collective action but also strengthens leadership and organization at the village level (Cheng, 2011; Zhu et al., 2024). In addition, strong institutions can improve coordination and empower farmers in the production process and market regulation (Raharja et al., 2020). Government subsidies in market regulation have been more compensatory than encouraging increased productivity. Therefore, more targeted and sustainable policies are needed to strengthen the agricultural sector (Kephe et al., 2021; Lukomets, 2024). Other supporting steps that need to be taken include the provision of production facilities, equipment modernization, market orientation in processing, and the reduction of transportation costs to improve the efficiency of the agro-industry (Kaliev et al., 2014).

The development of taro agribusiness based on local wisdom in West Papua requires a comprehensive approach that includes production, processing, marketing, as well as institutional and policy support of local governments. This integrated approach is expected to make taro a leading commodity in the region, increase farmers' yields and incomes, while strengthening sustainable food security, empowering communities, and preserving local culture.

CONCLUSION

The S-O strategy leverages internal strengths such as abundant local seeds, agroclimatic suitability, and traditional knowledge to increase taro production, expand marketing access beyond local areas, and develop processed taro products that cater to growing health-conscious consumer trends. The W-O strategy addresses weaknesses like limited farming equipment access, capital constraints, and the absence of farmer groups by providing production facilities, fostering cooperation with financial institutions, and forming taro farmer groups to strengthen collective bargaining and resilience. The S-T strategy uses farmers' expertise to build capacity through training and establishes special taro cultivation areas to optimize resources while managing risks like land disputes and climate impacts through stakeholder collaboration. The W-T strategy aims to modernize taro processing technologies, implement price regulations to improve competitiveness, and promote technological innovations that increase efficiency and mitigate risks such as disease and market competition. Overall, enhancing production, capacity-building, marketing, and product diversification with technological innovation and institutional support is key to developing taro agribusiness in West Papua. Future research should examine the long-term impacts of these integrated strategies on farmers' livelihoods, sustainability, and market dynamics to inform adaptive policy and scalable models for other indigenous food systems. The authors would like to thank the Rector of Universitas Pendidikan Muhammadiyah Sorong and the Director of Lazismu PP Muhammadiyah for their funding support for this research. AT was responsible for formulating the research concepts, collecting and analyzing data, preparing the article, editing, and responding to reviewer comments. IP contributed research ideas, provided direction and supervision, reviewed manuscript drafts, and followed up on reviewer comments. ATN assisted in conceptual formulation, provided guidance and supervision, reviewed the article, and responded to reviewer input. EG contributed to concept formulation, offered guidance and supervision, reviewed the manuscript, and addressed reviewer comments. The authors declare that there is no conflict of interest.

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