



Palm Sugar Farmers' Approach To Facing Marketing Challenges

Ramliadi¹, Halbi¹, Hamsah¹

¹Institut Teknologi Dan Bisnis Muhammadiyah Polewali Mandar, Indonesia

*Corresponding Author: Ramliadi

Email: ramliadi.agr23@itbmpolman.ac.id



Article Info

Article history:

Received 12 July 2026

Received in revised form 4

August 2026

Accepted 28 August 2026

Keywords:

Digital Marketing

Palm Sugar Farmers

SWOT Analysis

TOWS Strategy Value Chain

JEL Classification:

Q13; Q12; M31; O33; R11.

Abstract

This study examines the approaches adopted by palm sugar farmers to address marketing challenges in Mambu Village, Luyo District, Polewali Mandar Regency, Indonesia. A qualitative descriptive approach was employed, involving 15 informants selected via purposive sampling specifically palm sugar farmers with at least two years of production experience and direct involvement in marketing activities. Data were collected through semi-structured interviews, direct observation, and documentation, and validated using source triangulation involving farmers, collectors, and community leaders. The findings reveal that palm sugar farmers possess several strengths, including high production capacity (10–15 tons per month), a distinctive molded palm sugar product weighing approximately 1 kg per unit, and consistently high market demand. However, these advantages are constrained by structural weaknesses, notably the farmers' total reliance on middlemen as their sole marketing channel, low digital literacy, limited product storage capacity, and the absence of palm sugar tree replanting practices. A SWOT analysis identified rising external demand and the expansion of digital marketing platforms as key opportunities, while monopsonistic pricing, market fluctuations, and declining raw material sustainability were identified as major threats. Based on these findings, four adaptive marketing strategies were formulated using the TOWS framework: market expansion via digital platforms, strengthening product differentiation, enhancing digital and packaging capabilities, and bolstering local institutional collaboration through farmer groups and Village-Owned Enterprises (BUMDes). These strategies are expected to improve farmers' bargaining power, increase marketing efficiency, and foster the long-term sustainability of the palm sugar industry.

Introduction

Mambu Village, located in Luyo District, is a key center for traditional palm sugar production in Polewali Mandar Regency. Palm sugar, derived from the sap of the sugar palm tree (*Arenga pinnata*), serves as the primary source of income for nearly 50% of the village's population. Average production reaches approximately 10–15 tons per month, with a characteristic unit weight of around 1 kilogram, making the product highly sought after by both local consumers and buyers from outside the region (Polewali Mandar Agriculture Office, 2024).

However, this potential has not been fully optimized. Only about 20–30% of total production reaches markets outside the village due to limitations in distribution and promotion activities. While market prices in urban areas range from IDR 25,000 to IDR 30,000 per kilogram, locally produced palm sugar often sells for less than IDR 20,000 per kilogram. This disparity indicates that the economic value of the produced palm sugar has not been maximized (Asmira et al., 2025; Mohammed et al., 2023; Carvajal et al., 2024; Afghan et al., 2023).

Meanwhile, rapid technological advancements and the current digital era have created new marketing opportunities through social media and digital platforms (Punjabi et al., 2024; Sudirjo et al., 2023; Antczak, 2024). Unfortunately, most palm sugar farmers in Mambu Village have yet to fully capitalize on these opportunities. Their marketing strategies remained largely traditional and lack integration with information technology (Mariam, 2024; Kaur et al., 2022; Alam & Mohanty, 2022). Furthermore, farmers' experience, knowledge, and ability to adapt to market changes are crucial factors influencing the success of local product marketing. While various previous studies have examined the impact of the COVID-19 pandemic on agribusiness activities, research specifically detailing the adaptive approaches and strategies adopted by palm sugar farmers in remote rural areas during the post-pandemic period remains limited (Wirajaya et al., 2022; Siaw et al., 2025). In reality, the strategies farmers employ to address marketing challenges depend heavily on their socio-cultural context and their adaptive capacity in responding to changing market conditions (Morales et al., 2022; Ndunguru et al., 2025; Windiani et al., 2026; Mabaleka et al., 2025; Adusei et al., 2025; Takagi et al., 2024; Osei-Acheampong & Opoku Mensah, 2025).

In this context, a descriptive qualitative approach is considered highly relevant. This study aims not only to identify the technical constraints encountered in marketing activities but also to gain a comprehensive understanding of the farmers' experiences, adaptation patterns, and strategies developed in response to market dynamics. Through direct observation and in-depth interviews, the study seeks to present a comprehensive picture of how farmers in Mambu Village strive to sustain their palm sugar businesses amidst challenges related to distribution, digitalization, and the competitiveness of local products. Consequently, this research is expected to provide not only practical contributions to palm sugar farmers in Mambu Village by enhancing market access and improving their economic well-being but also theoretical contributions by enriching the literature on local agribusiness marketing strategies through a participatory and contextual approach (Andi Sumarlin & Rachmawaty, 2024; Fadli et al., 2023; Makkarennu et al., 2024).

Methods

Study Area

This research was conducted in Mambu Village, Luyo District, Polewali Mandar Regency, West Sulawesi Province, Indonesia. Mambu Village was purposively selected due to its status as a major hub for the traditional palm sugar agro-industry in Polewali Mandar Regency; here, sugar palm sap (**Arenga pinnata**) serves as the primary source of livelihood for nearly 50% of households, with an active producer base estimated at 80–100 farming households (Polewali Mandar Agriculture Office, 2024). The village records a high aggregate production capacity, ranging from 10 to 15 tons of molded palm sugar per month, with a characteristic weight of approximately 1 kg per unit.

Despite its substantial production base, preliminary observations and local agricultural extension data reveal systemic vulnerabilities: approximately 70–80% of production volume remains locked within a traditional supply chain dominated by middlemen (**tengkulak**). This results in significant price disparities, where farmers receive less than IDR 20,000/kg, contrasting sharply with urban retail prices of IDR 25,000–30,000/kg (Asmira et al., 2025). Furthermore, low digital literacy and the absence of collective marketing institutions (such as Village-Owned Enterprises/BUMDes or active cooperatives) limit independent product penetration into markets outside the village to just 20–30%. These empirical characteristics make Mambu Village a representative and academically compelling case study site for

examining the adaptive approaches farmers employ in response to a monopsonistic market structure and barriers to digital technology adoption.

Research Design

This study employs a descriptive qualitative approach to provide a detailed account of the approaches and strategies adopted by palm sugar farmers in addressing marketing challenges. A qualitative approach enables researchers to gain an in-depth understanding of the socio-economic phenomena experienced by palm sugar farmers, based on their direct experiences in the field. Rather than emphasizing numerical data, this approach focuses on understanding meanings and processes through intensive interaction between researchers and informants.

Data Sources

This study utilizes both primary and secondary data. Primary data were obtained directly through interviews, field observations, and documentation involving palm sugar farmers as the key actors in production and marketing activities. Secondary data were gathered from supporting documents, including farmer group records, production data obtained from the village government, and literature regarding agricultural marketing strategies. Smartphones were also used to record interviews and document field activities.

Participants

The participants consisted of active palm sugar farmers in Mambu Village who were directly involved in production and marketing activities. Informants were selected using a purposive sampling method based on predetermined criteria, including having operated a palm sugar business for at least two years, having direct involvement in marketing activities, and possessing a sufficient understanding of local market dynamics. In addition to farmers, local collectors and community figures with relevant knowledge were also included as research informants.

Data Collection

Data were collected using three primary techniques: semi-structured interviews, direct observation of production and marketing activities, and document review. Documentation included photographs, farmer group administrative records, and documents obtained from the village government. During fieldwork, the researcher interacted directly with informants to explore their experiences regarding marketing challenges and the strategies employed to address them.

Data Validation

To ensure data credibility, source triangulation was employed by comparing information obtained from various sources, including farmers, collectors, community leaders, and official documents. Data collection continued until data saturation was reached a point where additional interviews yielded no new or significant findings.

Data Analysis

The collected data were analyzed using a descriptive qualitative approach based on the interactive model proposed by Miles, Huberman, and Saldaña (2023), which encompasses data reduction, data display, and inductive conclusion drawing. To formulate marketing strategies objectively, empirical data from 15 key informants, participatory observation results, and secondary documents were classified into internal and external factor evaluations. Internal factors (Strengths and Weaknesses) were identified and prioritized based on resource capacity, the distinctive quality of the 1-kg molded product, capital limitations, and the marketing and

supply chain constraints experienced by informants. External factors (Opportunities and Threats) were mapped based on macro-market dynamics outside the village, preferences for healthy natural sweeteners, price fluctuations, the risk of intermediary monopsony, and the lack of sugar palm crop regeneration. The SWOT matrix is then systematically synthesized and translated into a TOWS matrix by matching four strategic pillars: leveraging opportunities through internal strengths (S–O strategy), addressing weaknesses by capitalizing on opportunities (W–O strategy), utilizing strengths to mitigate market threats (S–T strategy), and minimizing internal weaknesses to avoid long-term business threats (W–T strategy).

Result and Discussion

This study on the approaches adopted by palm sugar farmers to address marketing challenges was conducted in Mambu Village, Luyo District, Polewali Mandar Regency, involving 15 informants selected through purposive sampling. The informants consisted of farmers who had been engaged in palm sugar production for at least two years, were directly involved in marketing activities, and possessed a deep understanding of local market dynamics. Data were collected through semi-structured interviews, direct observation, and documentation, and subsequently validated using source triangulation involving farmers, collectors, and community leaders.

Overview of Palm Sugar Marketing in Mambu Village



Figure 1. Processing Oil Palm Sap into Palm Sugar

As shown in Figure 1, the processing of oil palm sap in Mambu Village is still carried out using traditional methods involving firewood stoves. Mambu Village is known as a major center for palm sugar production, with an average output of 10–15 tons per month. The product is distinguished by its characteristic size, weighing approximately 1 kilogram per unit. Although market prices in urban areas range from IDR 25,000 to IDR 30,000 per kilogram, the selling price received by farmers remains below IDR 20,000 per kilogram. Furthermore, only about 20–30% of the total production is directly absorbed by markets outside the village. This price disparity and limited market reach provide important context for understanding the subsequent field findings.

Field Findings from 15 Informants



Figure 2. Traditional Palm Sugar Molding and Packaging Process by Farmer Informants in Mambu Village

As shown in Figure 2, all informants (15 farmers) process palm sap into traditional molded palm sugar that is immediately ready for market. Interview results indicate that the finished palm sugar consistently sells out right after production, as it is immediately collected by partner traders or middlemen (*tengkulak*) who serve as their regular buyers. In addition to this marketing pattern, several key field findings gathered from the 15 informants are summarized below.

Market Price Monitoring. Farmers actively monitor and update themselves on price trends in the city market to guide decisions on when to sell their products; all informants described this practice, including Mrs. Rani, who stated:

Mrs. Rani: "I always find out what do you call it the price of the palm sugar, so we always know if the price is going up or down... we fellow palm sugar makers share information with each other."

This statement confirms the existence of an informal information-sharing mechanism among producers at the village level. This social capital serves as a self-mitigation tool for farmers, helping them avoid the price information asymmetry often exploited by buyers.

Dependence on Marketing Channels. A major structural weakness identified among all informants is their total reliance on partner traders or middlemen as their sole distribution channel, reflecting the enduring dominance of the traditional marketing system.

Mr. Ku'ding: "Yeah... once we've made it, there are regular customers who pick it up sort of like collectors as long as the price suits us, heh heh, yeah."

This excerpt reflects a strong patronage relationship and the convenience of instant transactions, where the certainty of product uptake outweighs the farmers' incentive to seek alternative distribution channels that might offer higher returns. Consequently, the farmers' bargaining position remains subordinate to that of the middlemen.

Absence of Replanting Practices. None of the informants had ever engaged in replanting sugar palm trees. Consequently, the long-term sustainability of raw material supplies has not yet become a primary concern among the farmers.

Mr. Khaidir: "As for replanting, it is rare or rather, no one does it because they rely on what you might call 'suckers' or saplings; sugar palm trees naturally sprout new shoots, but the quantity is limited."

These findings confirm that the current supply of *nira* (sugar palm sap) relies solely on natural regeneration (wild growth), with a population that is becoming increasingly scarce. This lack of conservation awareness poses a serious threat to the long-term viability of the palm sugar agro-industry in Mambu Village.

Temporary Storage Strategy. When market prices drop, 10 out of the 15 informants employ a temporary storage strategy, keeping their palm sugar in designated storage areas or refrigerators to preserve the product's physical quality.

Mrs. Lina: "You see... if the sugar price drops, I usually sell it anyway, but if it drops drastically, I store it in the fridge for a while though not for long, maybe just four days."

Mrs. Suriana: "There was a time when the price plummeted I forget which month it was. I didn't hand it over to the middleman immediately, but it didn't stay in storage for a full week because there was high demand, so I sold it. We still made a profit because, by the time I sold it, the price had stabilized somewhat."

The empirical data above demonstrates that farmers possess an adaptive awareness, allowing them to reject excessively low prices by delaying transactions. Household-scale cold storage is used to prevent physical quality degradation (such as melting), enabling farmers to release the product back onto the market once prices improve.

Product Storage Duration. Once market prices stabilize or rise, the informants promptly sell their products to middlemen. The storage period is relatively short, ranging from three to four days. Mrs. Sanawia: "I usually don't hold onto the stock for long; if the price is right, I sell it I keep it for about three days."

This limited storage duration is driven by two main factors: a lack of hygienic post-harvest preservation technology and the pressure of farmers' families needing liquidity (daily funds), which necessitates rapid cash turnover.

High Product Absorption Rate. Palm sugar products consistently sell out due to high demand from markets outside the village, even though the entire transaction value chain remains dominated by a single intermediary.

Mrs. Hawia: "Whenever I produce it, there is someone ready to pick it up and buy it the same day, because... well, it is widely used for food preparation."

Mr. Khaidir: "The demand for palm sugar is immense; it's not just within Mambu village there are many interested buyers from outside the village as well, because it serves as a key ingredient for things like... cakes and various dishes."

The high market absorption elasticity and the product's status as an essential culinary ingredient indicate significant strengths and highly promising opportunities. This demonstrates that the primary marketing obstacle is not a lack of market demand, but rather an inefficient supply chain management system that remains overly centralized around an intermediary.

SWOT Analysis Results

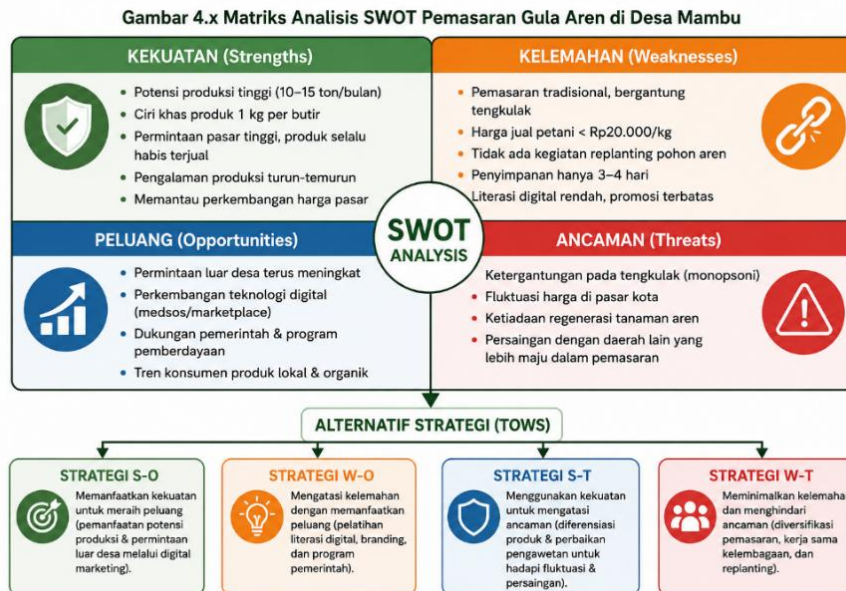


Figure 3. SWOT Analysis Matrix

Based on Figure 3, the SWOT analysis indicates that high production capacity (10–15 tons per month) and the unique characteristics of molded palm sugar weighing approximately 1 kg per unit constitute the local farmers' primary strengths. However, these strengths are constrained by structural weaknesses, specifically the farmers' reliance on middlemen (*tengkulak*) as their sole marketing channel and low adoption of digital technology. From an external perspective, rising demand from markets outside the village and increasing consumer preference for natural products offer opportunities to expand market reach. Nevertheless, farmers continue to face threats arising from monopsonistic pricing and risks associated with the lack of sugar palm tree regeneration.

The synthesis of these internal and external factors yields four alternative TOWS strategic pillars: capitalizing on opportunities (S–O Strategy), addressing weaknesses (W–O Strategy), mitigating threats (S–T Strategy), and ensuring the sustainability of farming operations (W–T Strategy). A comparative identification of SWOT indicators is presented in Table 4.1, followed by a detailed description of the proposed TOWS strategic alternatives in Table 4.2.

Referring to the qualitative data analysis framework outlined in the research methodology section, the identification and analytical classification of internal and external factors gathered from the empirical findings of 15 informants are synthesized in Table 1 and subsequently translated into the TOWS strategy matrix in Table 2.

Table 1. SWOT Matrix for Palm Sugar Marketing in Mambu Village

Strengths	Weaknesses
Mambu Village has a high palm sugar production capacity, averaging 10–15 tons per month, with distinctive products	Marketing activities remain traditional and are entirely dependent on a single distribution channel, namely partner traders or middlemen

weighing approximately 1 kg per piece and favored by both local and international consumers.	(<i>tengkulak</i>), with no alternative marketing channels available.
Demand for palm sugar is very high, resulting in all products produced by the 15 informants being sold immediately after production.	The selling price received by farmers (below IDR 20,000/kg) remains considerably lower than urban market prices (IDR 25,000–30,000/kg), indicating that the economic value of production has not been fully optimized.
Farmers have extensive experience in palm sugar production, inherited from generation to generation, and have established partnerships with regular middlemen who directly collect their products without marketing difficulties.	None of the informants had undertaken palm tree replanting activities, indicating that the long-term sustainability of raw-material supplies has not yet become a priority.
Farmers actively monitor and update market price developments as a basis for determining the appropriate time to sell their products.	The storage strategy adopted by 10 of the 15 informants during periods of declining prices is only temporary (3–4 days) and has not become a permanent solution for strengthening farmers' bargaining position.
	Low digital literacy and limited utilization of social media and online marketplaces result in only approximately 20–30% of total production being directly absorbed by markets outside the village.

TOWS Strategy Matrix

Based on the identification results presented in Table 1, the following alternative marketing strategies were formulated.

Table 2. TOWS Strategy Matrix for Palm Sugar Marketing

Strategy	Description
S–O Strategy	Utilize farmers' production experience, high production capacity (10–15 tons per month), and distinctive product characteristics (1 kg per piece) to expand market reach through social media and online marketplaces. At the same time, utilize strong demand from markets outside the village as a basis for negotiating more favorable prices with partner traders or middlemen (<i>tengkulak</i>).
S–T Strategy	Emphasize the unique local characteristics of the product and farmers' long-standing production experience to establish product differentiation amid interregional competition. In addition, extend the storage life of palm sugar beyond 3–4 days by improving preservation techniques, thereby providing farmers with greater flexibility in responding to market price fluctuations and reducing risks associated with the monopsony power of middlemen.
W–O Strategy	Provide digital literacy training to enable farmers to utilize social media and online marketplaces for direct marketing of palm sugar to markets outside the village. In addition, explore government-supported palm tree replanting programs to ensure the long-term sustainability of raw-material supplies.

W–T Strategy	Encourage diversification of marketing channels through cooperation with farmer groups, cooperatives, or micro, small, and medium enterprises (MSMEs) to reduce farmers' dependence on middlemen. At the same time, gradually initiate palm tree replanting programs to ensure sustainable raw-material availability and protect farmers' livelihoods in the future.
---------------------	--

The findings indicate that the palm sugar industry in Mambu Village possesses several key strengths, including strong market demand, a production capacity of 10–15 tons per month, and a distinctive product characteristic palm sugar unit weighing approximately 1 kg each. These advantages are further supported by an established marketing network involving partner traders or middlemen, enabling farmers to sell their entire output without facing marketing difficulties. However, this total reliance on a single distribution channel also represents a structural weakness. The selling price received by farmers remains below IDR 20,000 per kilogram despite urban market prices ranging from IDR 25,000 to IDR 30,000 per kilogram while only about 20–30% of total production is directly absorbed by markets outside the village. This imbalance aligns with the farmers' weak bargaining position identified in the research problem formulation.

The temporary storage practices adopted by 10 of the 15 informants demonstrate the farmers' independent efforts to respond to market price fluctuations. However, this strategy remains suboptimal, as the storage period is limited to just 3–4 days. Conversely, the absence of palm tree replanting activities constitutes a significant weakness that could pose a serious threat to long-term production sustainability, given the long growth period required before the trees can be tapped.

High demand for palm sugar from markets outside the village presents a major opportunity, particularly given advancements in digital technology and growing consumer preference for local products. If managed through a participatory approach including strengthening farmer groups, providing digital literacy training, and utilizing social media and online marketplaces farmers would have the chance to bolster their bargaining power and expand market access beyond the partner traders or middlemen who have traditionally served as the sole marketing channel. Such an approach also addresses the research objective of formulating a more effective and context-appropriate marketing strategy for palm sugar farmers in Mambu Village.

Agribusiness marketing mix theory emphasizes that successful market penetration relies heavily on integrating distribution channels (place) and fair pricing strategies (price) to strengthen producers' bargaining power (Mukhlis et al., 2024; Mukhlis et al., 2024). In the empirical context of Mambu Village, this theoretical perspective aligns with the findings of Fadli et al. (2023) and Irdamayanti et al. (2024), who identified that reliance on a single traditional supply chain involving middlemen creates a price gap at the farm level; farmers receive less than IDR 20,000 per kilogram, even though urban market prices reach IDR 25,000–30,000 per kilogram. However, there is a clear gap between the ideal concept of digital marketing which emphasizes efficient external market penetration via online platforms (Nugraha et al., 2025; Gamba, 2026) and the limited technology adoption observed among local farmers. This gap is consistent with the findings of Azhari and Febrianti (2025) and Junita et al. (2022), which indicate that without collaborative interventions involving product standardization, branding education, and marketing channel diversification through farmer groups, a substantial production capacity of 10–15 tons per month will remain trapped within a monopsonistic structure dominated by middlemen.

Value chain and integrated agribusiness system theories emphasize that the sustainability and income optimization of local farmers depend on integrating upstream production, secondary processing, and downstream marketing strategies capable of generating greater product value (Pratiwi et al., 2025; Makkarennu et al., 2023; Sharma & Sharma, 2025; Asmy et al., 2024). From this perspective, the sap of the sugar palm (*Arenga pinnata*) holds significant ecological and economic potential to drive rural economic development (Agustanti et al., 2024; Darma et al., 2023; Makkarennu et al., 2023; Pratiwi et al., 2025). However, empirical findings across the four study sites reveal similar structural vulnerabilities, as the majority of rural sugar palm farmers still rely on traditional, household-scale production systems that have not been fully optimized (Darma et al., 2023; Pratiwi et al., 2025). This vulnerability is reflected in the limited utilization of tappable sugar palm trees exemplified by the KTH Liku Pancing farmer group in Gowa Regency, which utilized only 20.53% of available trees (Pratiwi et al., 2025) as well as in the limited adoption of efficient processing technologies in Maros, Bone, and Bogor Regencies (Agustanti et al., 2024; Darma et al., 2023; Makkarennu et al., 2023).

Comparison of distribution channels in the four study areas reveals the same fundamental problem, namely the dominance of middlemen or middlemen, which creates a monopsonistic market structure (Agustanti et al., 2024; Darma et al., 2023; Makkarennu et al., 2023; Pratiwi et al., 2025). In Cenrana District, Maros Regency, production mapping shows that 80% of molded palm sugar production is controlled directly by intermediary traders, so farmers have no bargaining power in determining selling prices or payment schedules (Makkarennu et al., 2023). Similar conditions were observed among farmers in Pattimpa Village, Bone Regency, and Puraseda Village, Bogor Regency, where hardened palm sugar was sold to collectors at very low prices, ranging from IDR 3,000 to IDR 5,000 per unit or around IDR 25,000 per kilogram, due to concerns that the product would quickly melt or fail to be absorbed by the market (Agustanti et al., 2024; Darma et al., 2023). In contrast, retail prices in urban markets and shopping centers can reach IDR 69,000 per kilogram, indicating unfair profit margins and the dominant role of middlemen in taking the economic surplus produced by farmers.

According to the theory of added value and the concept of processing modernization, technical efficiency and hygienic production practices are important prerequisites for increasing farmers' bargaining power and increasing product selling prices (Darma et al., 2023; Pratiwi et al., 2025). Research conducted by Darma et al. (2023) in Bone Regency showed that technical interventions, including accurate measurement of cooking oil to reduce foam formation during boiling palm sap, use of hygienic processing equipment, and simple plastic packaging, were able to increase the shelf life of palm sugar and increase the selling price at the farmer level by up to two-fold, reaching IDR 7,000 per unit. Likewise, Pratiwi et al. (2025) emphasized that processing hardened palm sugar (Tombolo') into value-added products such as granulated palm sugar or liquid palm sugar packaged using modern methods can increase farmers' collective income up to five times, from IDR 4.47 million to IDR 21.8 million per month if 100% of the available trees are tapped. However, field findings show that such technological innovation is often hampered by inadequate production road infrastructure and low levels of financial literacy among rural communities (Darma et al., 2023; Pratiwi et al., 2025).

As a solution to supply chain imbalances and marketing constraints, rural economic institutional theory and digital marketing (e-commerce) have been proven to provide an effective way to reduce farmers' dependence on middlemen (Agustanti et al., 2024; Darma et al., 2023; Pratiwi et al., 2025). The intervention carried out by Agustanti et al. (2024) through the establishment of a Village-Owned Enterprise (BUMDes) in Puraseda Village, creating a strong institutional framework for collecting raw materials, processing them into palm sugar, and facilitating product certification and local branding. Strengthened integration of local

institutions, such as BUMDes and farmer groups (Kelompok Tani or KTH), with the use of social media and digital markets allows farmers to shorten distribution chains, reach markets directly at district and inter-provincial levels, and set selling prices that are much more competitive and profitable (Agustanti et al., 2024; Darma et al., 2023; Pratiwi et al., 2025).

Expanding the traditional marketing mix framework, the evolution of the 11P Marketing Mix theory, which includes product, price, place, promotion, people, process, physical evidence, packaging, promise, programming, and partnership, provides a comprehensive analytical framework for sustainable palm sugar agribusiness modernization (Halik & Pratiwi, 2025). An empirical study conducted by Halik and Pratiwi (2025) on the Buttu Puang Farmers Group (KTH Buttu Puang) in Polewali Mandar showed that although product diversification, including printed palm sugar, granulated palm sugar, and liquid palm sugar, as well as quality standards, had been established, several fundamental weaknesses still remained. These weaknesses included environmentally unfriendly packaging, the absence of a brand commitment narrative (promise) for printed palm sugar products, and limited partnerships still dominated by collectors. These findings align with those reported by Yuliana and Candraningrat (2025) in Halong Village, which emphasized the importance of accelerating social media-based digital marketing through platforms such as Facebook, Instagram, WhatsApp Business, and TikTok, along with improved product packaging, including the use of woven bamboo containers and stand-up pouches, to increase brand awareness and attract young consumers. Integrating the 11P marketing mix with digital marketing channels has not only been shown to significantly expand market reach and reduce the dependence of micro, small, and medium enterprises (MSMEs) on local middlemen, but has also become a strategic tool for promoting inclusive economic growth in rural areas in line with the Sustainable Development Goals (SDGs) on Economic Growth (Halik & Pratiwi, 2025; Yuliana & Candraningrat, 2025).

Accurate measurement of supply chain efficiency and accumulated economic value added are key indicators for assessing the sustainability of the palm sugar agro-industry (Caroline et al., 2021; Lestari et al., 2026). Applying the Hayami Method, Lestari et al. (2026) showed that in the Buhung Lali Farmers Group (KTH Buhung Lali) in Bulukumba, diversification of palm sap into granulated palm sugar generated an added value of IDR 4,800 per kilogram, with a 98% profit margin and a value-added ratio of 61%. These figures substantially exceed the efficiency and profitability of liquid palm sugar processing, which only generated an added value of IDR 600 per kilogram with a profit ratio of 66%. These comparative findings are consistent with a supply chain performance evaluation conducted by Caroline et al. (2021) in Sinjai Regency using an integrated Supply Chain Operations Reference (SCOR) and Objective Matrix (OMAX) approach, which classified local supply chain performance as moderate, with an index score of 6.62. This performance vulnerability was caused by weak coordination in upstream raw material procurement (Plan/Source KPI), high firewood consumption during processing activities (Manufacture KPI), and high transportation costs, along with the risk of product returns due to inconsistent quality standards (Delivery/Return KPI). The convergence of these two perspectives underscores that increasing farmers' economic surplus through downstream palm sugar development must be accompanied by improved integrated supply chain governance, from upstream production to downstream marketing (Caroline et al., 2021; Lestari et al., 2026; Witjaksono et al., 2024; Sila et al., 2025; Adinugraha, 2025).

The integration of empirical findings from 15 informants confirms that the palm sugar agro-industry in Mambu Village has a competitive advantage in its high production capacity (10–15 tons/month), distinctive taste, and inherited experience. This aligns with the findings of Rizal et al. (2026) in the same area, which emphasized that the primary strength of the Mambu

Village palm sugar small-scale industry stems from the quality of pure palm sap and the deep-rooted skills of local artisans. The shift in societal trends toward organic natural sweeteners opens up significant market opportunities. However, these advantages are hampered by similar structural weaknesses, namely traditional processing methods, limited working capital, and weak access to independent marketing, which triggers dependence on intermediary traders (middlemen) (Grant & Startz, 2022; Chisanga, 2023).

This reliance on a single intermediary channel and rudimentary equipment is also confirmed in the area surrounding Polewali Mandar Regency. As reported by Darwis et al. (2026) regarding Landi Kanusuang Village, household palm sugar production remains heavily dependent on traditional firewood-fueled equipment and family labor, with average revenues hovering around IDR 1,250,000 per production cycle. According to Darwis et al. (2026), limited capital, a lack of appropriate technology, and restricted marketing networks are the primary factors hindering the optimization of farmers' household income.

The convergence of empirical data from 15 informants with the studies by Rizal et al. (2026) and Darwis et al. (2026) provides strong justification for the TOWS matrix formulated in this study:

S–O & W–O Strategies: Addressing marketing gaps by accelerating digital literacy, utilizing e-commerce platforms, diversifying into high-value-added derivative products (such as granulated palm sugar and liquid palm sugar), and improving hygienic packaging designs (e.g., standing pouches).

S–T & W–T Strategies: Strengthening local institutions (Farmer Groups and Village-Owned Enterprises/BUMDes) to break the monopsonistic market structure dominated by middlemen, extending product shelf life through appropriate technology, and initiating sustainable sugar palm replanting programs in collaboration with the local government.

Conclusion

Based on the results and discussion of this study regarding the approaches adopted by palm sugar farmers to address marketing challenges in Mambu Village, Luyo District, Polewali Mandar Regency, two main conclusions can be drawn in line with the research objectives.

Marketing Challenges Faced by Palm Sugar Farmers in Mambu Village

Palm sugar farmers in Mambu Village face structural marketing challenges characterized by total reliance on a single marketing channel intermediaries or middlemen resulting in a monopsonistic market structure. This situation has created a significant price gap; farm-gate prices remain below IDR 20,000 per kilogram, whereas urban market prices range from IDR 25,000 to IDR 30,000 per kilogram. Consequently, only about 20–30% of total production is absorbed directly by markets outside the village. These challenges are further exacerbated by limited digital literacy and low adoption of marketing technology, temporary storage methods that preserve product quality for only 3–4 days, and a lack of initiatives to replant palm sugar trees, which threatens the long-term sustainability of raw material supplies.

Marketing Strategies to Enhance Competitiveness and Farmer Welfare

To address these limitations, several adaptive and context-specific marketing strategies can be developed.

S–O Strategy. Leverage high production capacity (10–15 tons per month) and the distinctive molded palm sugar product (approximately 1 kg per unit) to expand direct market access via social media and online marketplaces.

S–T Strategy. Strengthen the identity of the local palm sugar product and extend its shelf life through improved processing and preservation techniques, thereby enhancing farmers' bargaining power against market price fluctuations and reliance on middlemen.

W–O Strategy. Provide training on digital literacy, modern packaging, and branding techniques, while also exploring government-supported palm sugar tree replanting programs.

W–T Strategy: Encourage the formation and strengthening of local institutions including farmer groups and Village-Owned Enterprises (BUMDes) to shorten marketing chains, promote the development of downstream products (such as diversified palm sugar goods), and initiate sustainable sugar palm conservation programs.

Recommendations

In line with the study's conclusions, the following recommendations are proposed for relevant stakeholders.

For Palm Sugar Farmers and Farmer Groups in Mambu Village

Farmers are encouraged to optimize the role of farmer groups as platforms for collective production and marketing activities, thereby strengthening their bargaining power regarding selling prices.

Farmers are also advised to gradually adopt digital marketing platforms such as WhatsApp Business, Facebook, and Instagram while simultaneously initiating sugar palm replanting activities to ensure a long-term, sustainable supply of raw materials.

For the Mambu Village Government and the Polewali Mandar Regency Government

Facilitate the establishment and official registration of a Village-Owned Enterprise (BUMDes) or an agribusiness cooperative capable of serving as an aggregator and processor for value-added palm sugar products, such as granulated and liquid palm sugar.

Provide technical training programs for palm sugar producers focusing on production sterilization and hygiene, eco-friendly packaging innovation, financial literacy, and digital marketing.

For Future Researchers

Future studies are advised to employ quantitative approaches, such as measuring economic value-added using the Hayami Method or evaluating supply chain performance via the Supply Chain Operations Reference (SCOR) framework.

Future researchers are also encouraged to investigate the long-term effectiveness of BUMDes-based institutional support in reducing farmers' reliance on middlemen by shortening traditional distribution chains.

References

- Adda, H. W. (2023). Strategi pemasaran gula aren dalam meningkatkan kesejahteraan masyarakat di Desa Sikara Tobata, Kecamatan Sindue Tobata, Kabupaten Donggala. *Jurnal Manajemen Riset Inovasi*, 1(2), 278–287.
- Adinugraha, H. H. (2025). Sustainable Food Governance in Subang through Strengthening Central Markets and Integrating the Upstream-Downstream Supply Chain. *Scientific Journal of Governance and Accountability (SINGA)*, 3(2), 9-9.
- Adusei, F. Y., Agyemang-Duah, W., Akowuah, Y. A., & Adebayo, B. O. (2025). Cultivating resilience: localized insights into climate impacts and gendered adaptation strategies

- in smallholder farming in Ghana. *Frontiers in Climate*, 7, 1727893. <https://doi.org/10.3389/fclim.2025.1727893>
- Afghan, S., Khan, M. E., Arshad, W. R., Malik, K. B., & Nikpay, A. (2023). Economic importance and yield potential of sugarcane in Pakistan. In *Sugarcane-its products and sustainability*. IntechOpen. <https://doi.org/10.5772/intechopen.105517>
- Agustanti, R. D., Ariani, M. B. N., & Wirawan, R. (2024). Peningkatan perekonomian petani gula aren melalui pendaftaran Badan Usaha Milik Desa dalam mendukung Tujuan Pembangunan Berkelanjutan. *JMM (Jurnal Masyarakat Mandiri)*, 8(2), 2196–2205. <https://doi.org/10.31764/jmm.v8i1.21984>
- Alam, A., & Mohanty, A. (2022, November). Business models, business strategies, and innovations in EdTech companies: integration of learning analytics and artificial intelligence in higher education. In *2022 IEEE 6th Conference on Information and Communication Technology (CICT)* (pp. 1-6). IEEE. <https://doi.org/10.1109/CICT56698.2022.9997887>
- Antczak, B. (2024). The influence of digital marketing and social media marketing on consumer buying behavior. *Journal of modern science*, 56(2), 310-335. <https://doi.org/10.13166/jms/189429>
- Asmy, A. E., Rauf, A., Rahmawaty, Badaruddin, & Khasanah, U. (2024). Reformulation of Persimmon Value-Added Model: Product Downstream Development Strategy for Farmers in East Java, Indonesia. *Resources*, 13(3), 34. <https://doi.org/10.3390/resources13030034>
- Azhari, G. S., & Febrianti, T. (2025). Strategi pengembangan pemasaran gula aren di Kabupaten Garut. *Agritekh (Jurnal Agribisnis dan Teknologi Pangan)*, 5(2). <https://doi.org/10.32627/agritekh.v5i2.1243>
- Caroline, A., Makkarennu, & Syahidah. (2021). Pengukuran kinerja usaha gula aren menggunakan integrasi Supply Chain Operation Reference (SCOR) dan Objective Matrix (OMAX). *International Journal of Science and Management Studies (IJSMS)*, 4(1), 75–84. <https://doi.org/10.51386/25815946/ijms-v4i1p107>
- Carvajal, J., Sarache, W., & Costa, Y. (2024). Economic Justice in the Design of a Sugarcane-Derived Biofuel Supply Chain: A Fair Profit Distribution Approach. *Logistics*, 8(4), 122. <https://doi.org/10.3390/logistics8040122>
- Chisanga, C. (2023). *Effectiveness of the Lusaka stock exchange alternative-marketing in capital finance for small and medium enterprises (SMEs) in Zambia* (Doctoral dissertation, The University of Zambia).
- Darwis, I., Halbi, & Rahman, A. (2026). Analisis produksi gula aren dalam peningkatan pendapatan rumah tangga di Desa Landi Kanusuang Kecamatan Mapilli Kabupaten Polewali Mandar. *Journal of Management and Social Sciences*, 5(3), 139–149. <https://doi.org/10.55606/jimas.v5i3.2821>
- Fadli, A., Asngadi, & Adda, H. W. (2023). Strategi pemasaran gula aren dalam meningkatkan kesejahteraan masyarakat di Desa Sikara Tobata, Kecamatan Sindue Tobata, Kabupaten Donggala. *MRI: Jurnal Manajemen Riset Inovasi*, 1(2). <https://doi.org/10.55606/mri.v1i2.1087>

- Gamba, P. (2026). The Impact of Digital Marketing on Market Penetration: Strategic Implications for Emerging Markets. *International Journal of Marketing and Digital Creative*, 4(1). <https://doi.org/10.31098/ijmadic.v4i1.3553>
- Grant, M., & Startz, M. (2022). *Cutting out the middleman: The structure of chains of intermediation* (No. w30109). National Bureau of Economic Research.
- Irdamayanti, Magfirah, Asnita, A., Septianti, A., & Khaeril, M. (2024). Analisis pendapatan dan strategi pemasaran gula aren di Desa Bonto Katute Kecamatan Sinjai Borong. *Agrisosco: Jurnal Pertanian dan Sosial Ekonomi*, 1(1), 6–1. <https://doi.org/10.61316/asej.v1i1.24>
- Junita, A., Meutia, R., Andiny, P., & Wahyuningsih, P. (2022). Standarisasi produk dan penetapan strategi pemasaran gula semut sebagai upaya peningkatan daya saing produk di desa. *Jurnal Buletin Al-Ribaath*, 19(1), 49–54.
- Kaur, R., Singh, R., Gehlot, A., Priyadarshi, N., & Twala, B. (2022). Marketing strategies 4.0: Recent trends and technologies in marketing. *Sustainability*, 14(24), 16356. <https://doi.org/10.3390/su142416356>
- Mabaleka, A. T., Nkwenkwe, S., Matiso, L., & Chitongo, L. (2025). Perceptions and Adaptation Strategies to Climate Change among Small-Scale Farmers in Mangolong Village, Eastern Cape, South Africa. *iRASD Journal of Energy & Environment*, 6(1), 127-147. <https://doi.org/10.52131/jee.2025.0601.0059>
- Mariam, S. (2024). Building competitive advantage through information technology integration in marketing and branding management strategies. *Golden Ratio of Mapping Idea and Literature Format*, 4(2), 111-139. <https://doi.org/10.52970/grmilf.v4i2.356>
- Mohammed, M. Z. R., Ng, Z. W., Putranto, A., Kong, Z. Y., Sunarso, J., Aziz, M., ... & Butar, I. (2023). Process design, simulation, and techno-economic analysis of integrated production of furfural and glucose derived from palm oil empty fruit bunches. *Clean Technologies and Environmental Policy*, 25(5), 1551-1567. <https://doi.org/10.1007/s10098-022-02454-3>
- Morales, L. V., Robiglio, V., Baca, M., Bunn, C., & Reyes, M. (2022). Planning for adaptation: a system approach to understand the value chain's role in supporting smallholder coffee farmers' adaptive capacity in Peru. *Frontiers in climate*, 4, 788369. <https://doi.org/10.3389/fclim.2022.788369>
- Ndunguru, F., Mbunda, K., & Ndunguru, G. (2025). Institutional Challenges Constraining the Performance of Agricultural Marketing Cooperative Societies (AMCOs) amid Climate Change: Insights from Coffee Farming in Nyasa District. *Journal of Management Studies and Development*, 4(03), 389-405. <https://doi.org/10.56741/jmsd.v4i03.1225>
- Osei-Acheampong, B., & Opoku Mensah, S. (2025). Impact of the rural enterprise programme interventions on smallholder farmers' climate adaptation strategies: Qualitative evidence from Ghana's transitional agro-ecological zone. *Community Development*, 56(1), 125-150. <https://doi.org/10.1080/15575330.2024.2403009>
- Punjabi, M. P., Aruna, V., Prasad, R. R., Labhane, S., & Badhusha, M. H. N. (2024). Navigating the new wave; unveiling the transformation effects of social media on digital marketing in the emerging era. *Journal of Informatics Education and Research*, 4(1), 35-41. <https://doi.org/10.52783/jier.v4i1.516>

- Rizal, M., Ghulam, R. A., & Alwi, M. (2026). Strategi pengembangan industri kecil gula aren di Desa Mambu. *Al-Mustla: Jurnal Ilmu-Ilmu Keislaman dan Kemasyarakatan*, 8(1), 113–127. <https://doi.org/10.46870/jstain.v8i1.2273>
- Sharma, R., & Sharma, S. K. (2025). Optimizing agricultural downstream supply chain: addressing information asymmetry and losses. *Business Process Management Journal*, 31(7), 2801-2824. <https://doi.org/10.1108/BPMJ-02-2024-0097>
- Siaw, D., Ofosu, G., & Sarpong, D. (2025). Short-term gain, long-term loss: Exploring the effects of covid-19 survival strategies on rural livelihoods and the agrarian economy. *Journal of Rural Studies*, 113, 103523. <https://doi.org/10.1016/j.jrurstud.2024.103523>
- Sila, A., jumadi Kirnadi, A., & Mursalin, A. (2025). Strategies for Developing Palm Oil Marketing Channels: A Literature Review on Profit Margins, Farmer Shares, and Distribution Chain Optimisation. *INTERNATIONAL JOURNAL OF ECONOMIC LITERATURE*, 3(3), 470-480.
- Sudirjo, F., Anam, C., & Pranawukir, I. (2023). Exploring the impact of social media on online marketing strategies in the era of information technology: Challenges and opportunities in anticipation of the new year. *Jurnal Minfo Polgan*, 12(2), 2485-2492. <https://doi.org/10.33395/jmp.v12i2.13300>
- Takagi, S., Numazawa, Y., Katsube, K., Omukai, W., Saijo, M., & Ohashi, T. (2024). Theorizing the socio-cultural dynamics of consumer decision-making for participation in community-supported agriculture. *Agricultural and Food Economics*, 12(1), 22. <https://doi.org/10.1186/s40100-024-00318-6>
- Windiani, W., Rahadiantino, L., & Hidayah, A. R. (2026). The Adaptive Capacity of Coffee Farmers in Facing Climate Change at Wonosalam Plantation Area, Jombang Regency. *KnE Social Sciences*, 11(4), 1. <https://doi.org/10.18502/kss.v11i4.21228>
- Wirajaya, I., Milenia, R. T., Hidayat, I., Azhar, B. S., Saputri, A. A. I. A., Dellaneyra, L. S., Hidayat, A., Kumara, N. P. A. A., Kurniati, K., Putri, S. D., Andriani, T., Wandiyani, T., & Farista, B. (2022). Pendampingan dalam produksi dan pemasaran gula aren cair di Desa Kekait, Kecamatan Gunungsari, Kabupaten Lombok Barat. *Jurnal Pengabdian Magister Pendidikan IPA*, 5(2). <https://doi.org/10.29303/jpmpi.v5i2.1559>
- Witjaksono, J., Djaenudin, D., Fery Purba, S., Yulianti, A., Fadwiwati, A. Y., Muslimin, ... & Seerasarn, N. (2024). Corporate farming model for sustainable supply chain crude palm oil of independent smallholder farmers. *Frontiers in Sustainable Food Systems*, 8, 1418732. <https://doi.org/10.3389/fsufs.2024.1418732>