

Feasibility Analysis of Mangrove Syrup Enterprises and Institutional Patterns of the Daun Harum and Talitah Groups in Tanjung Laut Indah, Bontang City, Indonesia

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ABSTRACT

*Bontang City, located in East Kalimantan Province, has an extensive coastal area with well-preserved mangrove ecosystems. These mangrove resources have not yet been fully optimized to enhance the economic well-being of local communities. One of the utilization efforts currently undertaken is the processing of *Sonneratia ovata* mangrove fruit into high-value mangrove syrup. The Daun Harum Group, based in Tanjung Laut Indah Sub-district, has developed a mangrove syrup production enterprise as a flagship local product, in collaboration with the Talitah Group, which acts as the supplier of raw materials. This study aims to analyze the financial feasibility of the mangrove syrup business and to describe the institutional partnership established between the two groups. The research was conducted over nine months, from August 2024 to May 2025. Both primary and secondary data were utilized. Primary data were collected through direct observation and interviews with respondents, while secondary data were obtained through literature review. Respondents in this study consisted of the management and members of both Daun Harum and Talitah Groups. Respondents were selected using purposive sampling, with the following criteria: (1) actively involved in managing the group, (2) knowledgeable about the group's organizational management, and (3) willing to collaborate with the researcher in providing the required data and information. Based on these criteria, the total number of respondents was eight (8) individuals (2 administrators and 2 members from each group). Data were analyzed using business feasibility analysis and institutional descriptive analysis. The results of the study indicate that the mangrove syrup business is financially viable, with a Net Profit IDR 14,433,358 a Revenue Cost Ratio (RCR) of 1.41, a Payback Period (PP) of 0.06 years, and a Return on Investment (ROI) of 128.5%. The institutional structure that emerged represents a marketing and credit-based institution, which functions effectively in terms of jurisdictional boundaries, ownership rights, and rules of representation. This study demonstrates that the collaboration between two local institutions focused on mangrove resource management can serve as a strategic approach to sustainable economic empowerment for coastal communities*

INTRODUCTION

Bontang City, located in East Kalimantan Province, is characterized by its extensive coastal and marine areas, covering approximately 24.4 km² or 70.29% of its total territory, with a coastline stretching 161.19 km. The city is widely recognized as a maritime hub, with abundant marine fisheries that support local livelihoods. The coastal waters of Bontang are highly productive and serve as a foundation for economic activities in the fisheries sector (Sudirman et al., 2023). In addition, the region is endowed with rich mangrove ecosystems, covering about 2,935 hectares and consisting of diverse species, including *Sonneratia ovata* (Asia & Wijayanti, 2022).

Mangrove fruits, derived from species such as *Avicennia* sp., *Bruguiera* sp., *Rhizophora* sp., and *Sonneratia* sp., have long been consumed by Indonesian communities as supplementary food sources. Traditionally, these fruits have been processed into various products, including chips, cakes, dodol, and beverages. Despite their cultural significance, scientific information regarding the potential and nutritional benefits of mangrove fruits as food resources remains limited. This gap highlights the need for research that explores both ecological and economic dimensions of mangrove-based products.

One notable local initiative is the Daun Harum group in Tanjung Laut Indah Village, which produces mangrove syrup under the brand name Ovata. To ensure the continuity of high-quality raw materials, Daun Harum collaborates with the Talitah group, which supplies mangrove fruits. This collaboration has fostered a community-based institutional model that integrates production, marketing, and distribution. The sustainability and expansion of this enterprise, however, depend heavily on financial viability and effective institutional governance.

Research on the feasibility of mangrove syrup enterprises is therefore essential to determine whether such initiatives can be developed as economically viable ventures in the future. Bobadila et al. (2023) emphasize that financial feasibility studies in small-scale fisheries enterprises are crucial for improving efficiency and optimizing profitability. Common indicators used in financial feasibility analysis include the Revenue-Cost Ratio (RCR), Break-Even Point (BEP), Payback Period, Return on Investment (ROI), and Net Profit Margin (NPM). Furthermore, institutional strength within community-based enterprises plays a vital role in ensuring long-term sustainability. Syafril (2002) highlights that fisherfolk institutions, particularly those related to marketing and credit, are critical for enhancing bargaining power, production efficiency, and business stability. Structured and community-based institutional support is thus a prerequisite for inclusive and sustainable coastal development.

Based on this background, the objectives of this study are twofold: (1) to analyze the financial feasibility of mangrove syrup processing as a community-based enterprise in Bontang City, and (2) to examine the institutional collaboration between Daun Harum and Talitah groups in supporting the sustainability of mangrove syrup enterprises.

METHODOLOGY

Research Site and Period

This research was conducted over a three-month period, from January to May 2025, in Tanjung Laut Indah Village, South Bontang Subdistrict, specifically involving the Daun Harum Group and the Talitah Group. The study employed a combination of quantitative and qualitative approaches, aiming to assess the feasibility of mangrove syrup processing businesses and to analyze the institutional arrangements formed between stakeholder groups.

Types and Sources of Data

This study utilized two types of data, namely primary and secondary data. Primary data were obtained through in-depth interviews using a structured interview guide directed at members and administrators of the Daun Harum and Talitah groups. In addition, direct field observations were conducted to examine the

mangrove syrup production process and the collection of mangrove fruits. These observations were used to validate and complement the interview data.

Primary data included business profiles, production and marketing processes of mangrove syrup, economic performance indicators (production costs, output quantity, and product selling price), as well as institutional aspects such as historical background, representation rules, jurisdictional boundaries, property rights, and institutional patterns.

Sampling Method

The sampling technique used in this study was purposive sampling, where respondents were selected based on specific criteria relevant to the research objectives. The selected samples included the Daun Harum Group, the only mangrove syrup processing group, and the Talitah Group, which supplies mangrove fruits.

The criteria for respondents were: (1) direct involvement in production activities and institutional management of the groups; (2) knowledge of production processes, production costs, income, and institutional management; and (3) willingness to provide accurate and transparent data supporting the research objectives.

Purposive sampling is a non-probability sampling technique in which respondents are deliberately selected based on predetermined criteria established by the researcher (Justika et al., 2022, as cited in Yolanda et al., 2025).

Data Analysis Methods

Profit and Loss Analysis

This analysis aims to determine the financial performance of the business within a specific period, such as monthly operations. According to Irawan (2019), a profit and loss statement includes total revenue generated and total costs incurred. Profit and loss variables include production output, product selling price, and both direct and indirect costs. The steps of profit and loss analysis follow Soekartawi (2006, as cited in Purnamasari and Syafril, 2022).

Cost Analysis

Total cost is calculated as the sum of total fixed cost (TFC) and total variable cost (TVC). According to Sukirno (2002), total cost can be mathematically expressed as:

$$\mathbf{TC = TFC + TVC}$$

Where:

TC = Total Cost (Rp/month)

TFC = Total Fixed Cost (Rp/month)

TVC = Total Variable Cost (Rp/month)

Revenue Analysis

Revenue is closely related to production volume and selling price. Therefore, total revenue is calculated as the product of price and quantity sold (Fanindi et al., 2019).

$$\mathbf{TR = Pq \times Q}$$

Where:

TR = Total Revenue (Rp/month)

Pq = Price per unit product (Rp/package)

Q = Quantity of product sold (units/packages)

Income Analysis

Profit or income is defined as compensation for business risk, calculated as total revenue minus total cost (Puspita et al., 2022). Income is calculated using the following formula (Rumallang, 2019):

$$I = TR - TC$$

Where:

I = Income (Rp/month)

TR = Total Revenue (Rp/month)

TC = Total Cost (Rp/month)

Business Feasibility Analysis

The feasibility analysis in this study uses non-discounted investment criteria. Maulana (2022) states that non-discounted financial feasibility analysis does not consider the time value of money. This approach is supported by Syafril and Fahrizal (2021), who explain that financial feasibility in fisheries business can be assessed using Profit and Loss, Revenue Cost Ratio (R/C), Break Even Point (BEP), Payback Period (PP), and Return on Investment (ROI).

Revenue Cost Ratio (R/C Ratio)

The R/C Ratio measures business efficiency based on production costs. A business is considered feasible if the R/C value is greater than 1, indicating that revenue exceeds production costs (Harmono and Andoko, 2005). The formula is:

$$R/C = TR / TC$$

Where:

R/C = Revenue Cost Ratio

TR = Total Revenue (Rp/month)

TC = Total Cost (Rp/month)

Payback Period (PP)

The Payback Period analysis is used to determine the time required to recover the initial investment from net income (Antika and Kohar, 2014). The modified formula used in this study is:

$$PP = (\text{Total Investment} / \text{Net Profit}) \times (1/12)$$

A smaller Payback Period indicates faster capital recovery. Amir et al. (2022) state that PP can be compared with the economic lifespan of the main productive assets.

Break Even Point (BEP)

Break Even Point represents the condition where total revenue equals total costs, meaning no profit or loss is incurred (Sugiyono, 2016). According to Baharuddin et al. (2023), BEP occurs when revenue equals production cost. The formulas used are:

$$\text{BEP Production} = TC / \text{Price per unit}$$

$$\text{BEP Price} = TC / \text{Total Production}$$

$$\text{BEP Sales} = TFC / (\text{Selling Price} - \text{TVC})$$

Where:

TC = Total Cost

TFC = Total Fixed Cost

TVC = Total Variable Cost

S = Sales Revenue

Return on Investment (ROI)

ROI measures the efficiency of investment in generating net profit, expressed as a percentage. According to Syamsuddin (2009), ROI indicates the overall ability of a business to generate profit from its total assets. The formula is:

$$\text{ROI} = (\text{Net Profit} / \text{Total Investment}) \times 100\%$$

Descriptive Analysis

Descriptive research is conducted by explaining findings in narrative form (Ramdhan, 2021). In this study, institutional analysis describes the relationship between the Daun Harum and Talitah groups, including organizational structure, cooperation mechanisms, and task distribution.

Institutional patterns were analyzed based on three main aspects developed by Pakpahan (1989, as cited in Irnawati et al., 2022), namely:

Jurisdictional Boundaries

Jurisdictional boundaries refer to the division of roles and responsibilities between the Daun Harum and Talitah groups, particularly in the supply of mangrove fruits and syrup processing activities. Clear boundaries are essential to prevent conflict and overlapping authority.

Property Rights

Property rights refer to the ownership and management of resources, including mangrove fruits supplied by the Talitah Group and the final syrup product processed by the Daun Harum Group. This analysis examines how ownership and benefit-sharing are distributed between both groups.

Rules of Representation

Rules of representation refer to how both groups participate in decision-making and problem-solving processes. This includes representation in discussions, strategic decisions, and mechanisms ensuring that agreed decisions are accepted by all parties involved.

RESULT AND DISCUSSION

History and Development of the Ovata Mangrove Syrup Enterprise

Ovata Mangrove Syrup is one of the micro, small, and medium enterprises (MSMEs) located on Jalan Sultan Syahrir RT 05, Tanjung Laut Indah Sub-district, South Bontang District, Bontang City. This business was initiated in 2012 by Mrs. Amira, who later established a business group named Daun Harum. The enterprise focuses on producing mangrove syrup made from mangrove fruit of the species *Sonneratia ovata*, which is abundantly available in the surrounding environment. Supported by the readily available raw materials and Mrs. Amira's skills in processing mangrove fruit into syrup, the business gradually developed and formed a collective enterprise under the name Daun Harum.

In 2013, Ovata Mangrove Syrup officially obtained a copyright certificate for the brand "Daun Harum" as the identity of its mangrove syrup product. In 2018, the enterprise received a micro business operating license. The Daun Harum group has also been invited to conduct training outside the city, sharing knowledge and skills in processing mangrove fruit as an effort to empower communities and promote environmental conservation. The marketing distribution of the mangrove syrup covers Samarinda, Balikpapan, Tarakan, Pontianak, Jakarta, Surabaya, Yogyakarta, Makassar, and Bandung.

Processing Method

Mangrove syrup is produced using fruits from the species *Sonneratia ovata*, which are processed with various additional ingredients such as sugar and water to produce high-quality syrup. The stages of the mangrove syrup production process are as follows: Cutting and cleaning of *Sonneratia ovata* fruits ; Initial boiling; Coarse and fine filtration; Second boiling with sugar; Cooling and packaging

Business Feasibility Analysis

Profit and Loss Analysis

The profit and loss calculation of the mangrove syrup business is based on investment capital variables, production costs, production volume, and selling price. The total investment capital managed by the business group amounts to IDR 11,233,000, with monthly production costs of IDR 34,866,642. Both investment capital and production costs are funded by the group itself, and the enterprise has never applied for bank credit from financial institutions. Details of the investment capital and production costs are presented in the Table 1 below.

Table 1. Production cost details of mangrove syrup processing business

No	Description	Unit	Quantity	Price (Rp)	Cost per Production (Rp)	Monthly Cost (Rp)	(%)
A. Variable Costs (TVC)							
1	Sugar	kg	106	21,000	2,233,831	8,935,322	25.16
2	Water	liter	182	2,000	364,707	1,458,828	4.12
3	Mangrove fruit	kg	53	15,000	797,797	3,191,186	8.99
4	Packaging (100 ml bottle)	bottle	84	1,500	126,000	504,000	1.42
	Packaging (250 ml bottle)	bottle	63	2,500	157,500	630,000	1.77
	Packaging (350 ml bottle)	bottle	49	3,000	147,000	588,000	1.66
5	Sticker labels	sheet	1,286	3,000	3,858,000	15,432,000	44.26
Subtotal (TVC)					7,684,834	30,739,337	
B. Fixed Costs (FC)							
6	Electricity	unit	-	50,000	50,000	200,000	0.56
7	Gas	unit	-	50,000	50,000	200,000	0.56
8	Oil and maintenance	unit	-	150,000	37,500	150,000	0.42
9	Fuel (motorbike)	liter	-	10,000	25,000	100,000	0.28
10	Mobile credit/data	package	-	50,000	12,500	50,000	0.14
11	Depreciation	unit	15	427,306	106,826	427,306	-
12	Labor wages	person/month	15	200,000	750,000	3,000,000	8.45
Subtotal (FC)					1,031,826	4,127,306	
Total Cost (TC)					8,716,661	34,866,642	100

Table 1 shows that variable costs constitute the largest component of production costs in the mangrove syrup processing business. The highest proportion of variable costs is attributed to sticker expenses (44.26%). Packaging stickers play an important role in supporting product marketing success, as they contribute to product branding and consumer attractiveness.

Net profit generated from mangrove syrup sales is an important indicator in assessing the feasibility of this business. Mangrove syrup is marketed in three bottle sizes, namely 100 ml, 250 ml, and 350 ml, each with different selling prices. Product distribution is carried out at the production house, Farah Snack Store in Bontang, and through consumer demand outside Bontang City (including Tarakan, Pontianak, Balikpapan, Samarinda, Jakarta, Surabaya, Yogyakarta, Makassar, and Bandung) via intermediary traders. This indicates that mangrove syrup products have successfully penetrated markets outside Bontang City. The details of revenue are presented in Table 2.

Table 2. Revenue of mangrove syrup processing business

No	Description	Product Quantity (bottle)	Price (Rp/bottle)	Revenue per Production (Rp)	Monthly Revenue (Rp)	(%)	Remarks
1	Mangrove Syrup (100 ml)	84	15,000	1,260,000	5,040,000	10.22	Sold at production house
2	Mangrove Syrup (250 ml)	63	25,000	1,575,000	6,300,000	12.78	Sold at production house
		90	22,500	2,025,000	8,100,000	16.43	Sold at Farah Snack Store, Bontang
		1,000	23,000	5,750,000	23,000,000	46.65	Sold outside Bontang City
3	Mangrove Syrup (350 ml)	49	35,000	1,715,000	6,860,000	13.92	Sold at production house
Total Revenue		1,286	120,500	12,325,000	49,300,000	100	
Net Profit				3,608,339	14,433,358		

The 100 ml mangrove syrup has the lowest sales volume because it is only sold at the production house and during training and exhibition activities. Meanwhile, the 250 ml product is also distributed through Farah Snack Store in Bontang. This decision was made because Farah Snack Store is widely recognized by the community as a strategic and popular souvenir shop in Bontang City with high visitor traffic. The net profit generated by the business group is IDR 14,433,358 per month, calculated as the difference between total revenue and total production costs.

Revenue-Cost Ratio (R/C Ratio)

The R/C ratio represents the comparison between total revenue and total production costs. The business recorded an R/C ratio of 1.41, indicating that every IDR 1.00 of production cost generates IDR 1.41 of revenue. An R/C value greater than 1 indicates that the business operated by the Daun Harum group is economically efficient and profitable, generating a profit of approximately IDR 0.41 per unit cost. A higher R/C ratio indicates greater economic efficiency and business feasibility.

Payback Period (PP)

The Payback Period (PP) is used to determine the time required for an investment to be recovered through business profits. The mangrove syrup business, with an initial investment cost of IDR 11,233,000 and monthly production costs of IDR 34,866,642, has a relatively fast payback period of 0.06 years (approximately 0.78 months or 25 days).

According to Antika and Kohar (2014), an investment payback period of less than 3 years is classified as fast and economically feasible. Therefore, this business can be considered highly profitable and financially viable.

Break Even Point (BEP)

The Break-Even Point (BEP) is defined as the point at which the business reaches a condition where total revenue is equal to total production costs, resulting in neither profit nor loss. At this point, the net income is zero. The results of the break-even analysis are presented in Table 3.

Table 3. Break-Even Point (BEP) analysis results

Product	Quantity (bottles)	Price (Rp/bottle)	Revenue (Rp)	TVC (Rp)	TFC (Rp)	TC (Rp)	BEP Production (bottles)	BEP Price (Rp/bottle)	BEP Sales (Rp)
100 ml packaging	336	15,000	5,040,000	4,817,359	646,817	5,464,175	364	16,262	14,642,216
250 ml packaging	252	25,000	6,300,000	3,613,019	485,112	4,098,131	164	16,262	1,137,412
250 ml packaging	360	22,500	8,100,000	5,161,456	693,018	5,854,474	260	16,262	1,910,281
250 ml packaging	1,000	23,000	23,000,000	14,337,377	1,925,049	16,262,426	707	16,262	5,111,169
350 ml packaging	196	35,000	6,860,000	2,810,126	377,310	3,187,436	91	16,262	639,118

The results show that the mangrove syrup product in the 100 ml packaging has not yet reached the profit level, whereas the other packaging sizes have already generated profits. The 100 ml product is only sold at the production house, and its consumers are mainly local residents. Demand for this product remains low due to consumer preferences, where larger packaging sizes (250 ml and 350 ml) are considered more economical because the price difference is relatively small, while the volume obtained is greater.

Return on Investment (ROI)

The Return on Investment (ROI) analysis was conducted to evaluate the financial feasibility of the mangrove syrup processing business. The calculation compares net profit with total investment cost and is expressed as a percentage.

The ROI value of 128.5% indicates that the business is highly profitable and exceeds the benchmark of 6% interest rate of the People's Business Credit (KUR) provided by Bank BRI. This interest rate is a government policy designed to support MSME development.

The ROI result implies that every IDR 100 of invested capital generates a profit of IDR 128.5. Thus, the Daun Harum Group's business is financially feasible, as it is capable of generating sufficient profit to recover and exceed the initial investment cost.

Overall Financial Feasibility

The results of the financial feasibility analysis show that the mangrove syrup processing business managed by the Daun Harum Group, supported by raw material supply from the Talitah Group in Tanjung Laut Indah Village, South Bontang District, is profitable and feasible for further development.

The monthly net profit reaches IDR 14,433,358, with a Revenue Cost Ratio (R/C) of 1.41, Return on Investment (ROI) of 128.50%, and a Payback Period of only 0.06 years (approximately 0.78 months). In addition, the break-even points for production volume, price, and sales are below the actual operational conditions, indicating strong efficiency and business sustainability.

When compared with similar studies in Bontang City, the mangrove syrup business demonstrates superior financial performance. Justika et al. (2022), in their study on seaweed-based candied products in Bontang Kuala Village, reported a monthly profit of only IDR 2,148,500, with a relatively long payback period of 5.98 years (71.46 months).

Another study by Abdusysyahid et al. (2021) on tuna floss processing showed a lower financial performance, with a monthly profit of IDR 3,897,400, ROI of 3.2%, and a payback period of 15.93 years.

Furthermore, Syafril and Fidhiani (2020) reported a shrimp paste processing business with an ROI of 113.28%, monthly profit of IDR 4,963,494, and a payback period of 3.3 years. Although relatively good, its financial performance is still lower than that of the mangrove syrup business.

Based on the comparative analysis of fisheries-based processing businesses in coastal areas of Bontang City, the mangrove syrup enterprise can be considered one of the most prospective MSMEs. The business not only demonstrates strong financial performance but also has significant potential to improve coastal community welfare through job creation, utilization of local resources, and strengthening of institutional cooperation. This success indicates that mangrove syrup processing can serve as a replicable business model for other coastal areas to promote inclusive and sustainable local economic development.

Institutional Pattern of the Daun Harum and Talitah Groups

The institutional pattern between the Daun Harum Group and the Talitah Group is based on marketing and credit-based cooperation. The Talitah Group collects and markets mangrove fruit from its members to the Daun Harum Group. The purchased mangrove fruit is then processed into syrup and marketed to consumers both within and outside Bontang City. The institutional relationship between both groups can be analyzed through three main aspects of institutional analysis proposed by Pakpahan (1989) and applied in Irnawati et al. (2022), namely jurisdictional boundary, property rights, and rules of representation.

Jurisdictional Boundary

Jurisdictional boundary refers to the limits of authority over production factors, goods, and services. The institutional arrangement between the two groups reflects a clear division of roles. The Talitah Group is responsible for supplying mangrove fruit, which is sold to the Daun Harum Group at a price of IDR 15,000 per kilogram. Meanwhile, the Daun Harum Group is responsible for processing and marketing the final product.

Although there is no formal written agreement, coordination is conducted through direct communication between group leaders. The Daun Harum Group purchases approximately 100 kg of mangrove fruit per month and also maintains stock as a backup raw material supply. This division of roles reflects a production-based institutional collaboration, where Talitah provides the main input, while Daun Harum processes it into mangrove syrup for market distribution.

Property Rights

Property rights refer to mutually beneficial working relationships between parties with complementary access to resources. In this study, property rights include the rights and obligations of both groups. **Obligations of the Talitah Group:** To supply mangrove fruit according to the agreed quantity and promptly deliver it when required. To maintain product quality according to the standards required by the Daun Harum Group. To maintain good communication and coordination regarding changes in quantity and quality of supplied raw materials. **Rights of the Talitah Group:** To receive payment at the agreed price of IDR 15,000 per kg. **Obligations of the Daun Harum Group:** To provide payment according to the agreed quantity and price. To maintain communication regarding raw material needs in line with market demand.

Rights of the Daun Harum Group: To ensure stable supply of mangrove fruit in terms of price, quantity, and quality. To obtain information regarding raw material stock and availability from the Talitah Group.

Rules of Representation

Rules of representation refer to regulations determining who is involved in decision-making processes related to production and marketing. In this institutional system, decision-making remains informal and depends on direct communication between group leaders.

Key decisions related to production and pricing are made independently by each group without a formal joint forum. Meetings are only conducted when raw material procurement is required, and there are no regular meetings for long-term strategic planning. However, the relationship between the groups remains harmonious. External support is provided by forestry extension officers from the Production Forest Management Unit (KPHP), while production equipment assistance is provided by the Forestry Office.

Business Constraints

Marketing strategies are not yet optimal, as there is no consistent use of social media platforms such as Instagram, Facebook, or TikTok. Limited business partners. Currently, marketing is only conducted through consignment at Farah Snack Store, indicating the need for broader distribution networks.

Institutional Constraints

There is no formal written agreement regulating roles and responsibilities related to jurisdictional boundaries, property rights, and rules of representation in the cooperation between the Talitah and Daun Harum groups.

CONCLUSION

Based on the results and discussion, it can be concluded that the mangrove syrup processing business is profitable and feasible for future development. The business generates a monthly net profit of IDR 14,433,358, with a Revenue Cost Ratio (R/C) of 1.41, a Payback Period of 0.06 years (approximately 0.78 months), and a Return on Investment (ROI) of 128.50%. In addition, the break-even points for production volume, price, and sales remain below the actual operational levels, indicating that the business operates efficiently and has strong financial viability.

The institutional relationship between the Daun Harum Group and the Talitah Group is based on a marketing and credit-based cooperation system. This institutional arrangement functions effectively and is reflected in clear jurisdictional boundaries, well-defined property rights, and agreed rules of representation. Although the cooperation is still largely informal, it has proven to be stable and mutually beneficial for both groups.

RECOMMENDATIONS

For business actors in the Daun Harum and Talitah Groups, it is recommended that production capacity and market reach be increased in order to maximize the high profit potential indicated by the ROI and short payback period. Expanding production scale will allow the business to meet growing demand and strengthen its market position.

Product diversification is also strongly recommended by developing additional mangrove-based products such as dodol, jelly, mangrove tea, and candy. This strategy is important to reduce market saturation risks and improve product competitiveness in the long term. In addition, marketing strategies should be improved through modern approaches, including the use of social media platforms, e-commerce,

more attractive packaging designs, and obtaining halal and BPOM certification to increase consumer trust and market expansion.

Furthermore, financial management should be strengthened through proper cash flow management and systematic financial record-keeping. Accurate financial reporting will improve business transparency and facilitate access to funding from government programs, financial institutions, and potential investors. Human resource capacity should also be enhanced through continuous training in entrepreneurship, business management, financial literacy, and food processing technology.

For government and policymakers, it is recommended to strengthen financial support mechanisms for MSMEs through microcredit schemes and productive grants, particularly via local financial institutions or village-owned enterprises (BUMDes). Institutional strengthening and mentoring programs should also be provided, especially in areas such as organizational management, cooperative development, and digital administration, to further improve the effectiveness of existing groups.

Moreover, policies should be developed to support sustainable mangrove ecosystem conservation while simultaneously accelerating product certification processes. This will enable MSME products to access broader markets, including modern retail chains and export opportunities. Finally, stronger collaboration between business actors, universities, and industry stakeholders should be encouraged to promote innovation, enhance marketing networks, and develop sustainable and inclusive business models.

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