

## Analysis of Added Value and Development Strategy for The Coconut-Based Food Industry in North Sulawesi Province

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**Abstract:** Problems in developing the coconut-based creative industry in North Sulawesi Province include limited business capital and modern processing technology, inconsistent product quality, and weak promotion and marketing. As a result, the Micro, Small, and Medium Enterprises (MSMEs) sector is unable to maximize the potential of coconuts as a significant source of added value. This study aims to examine *the added value* of coconut-based food products and formulate policy strategies for the development of coconut-based creative industries MSME level. The research method is added value analysis using the Hayami (1987) approach and SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) for policy strategy formulation. The results of the study show that the output value of coconut-based food products reaches IDR 250,000 per unit, with an added value of IDR 25,214 per product and an added value ratio of 71%. Labor compensation is recorded at IDR 3,044 per kilogram or 12% of the added value, while the profit obtained is IDR 22,170 per product or 88%. SWOT analysis recommends a development strategy oriented towards a combination of S-O (Strengths-Opportunities) and W-O (Weaknesses-Opportunities), through improving production capacity and quality, strengthening promotion, and building partnerships with stakeholders, facilitated by the local government.

**Keywords:** Added Value Analysis; Coconut-Based Food Industry; Development Strategy; North Sulawesi Province

## Introduction

The multifaceted difficulties inherent in economic development encompass aspects like restricted earnings for local populations, considerable joblessness, and the sluggish advancement of economic activity within a region (Mukhlis et al., 2023; Rohani et al., 2024; Mubarokah et al., 2024). Agricultural development in Indonesia has a very important role in the nation's economy (Mukhlis et al., 2024; Rauf et al., 2024). Agriculture is an important contributor to the economy and welfare of people in many countries, including Indonesia (Aryawati & Budhi, 2018; Pinatik et al., 2025).

Agribusiness represents a specific kind of economic undertaking encompassing agricultural production,

essential infrastructure and resources, food transformation, market equilibrium, commerce in foodstuffs, alongside auxiliary operations like delivering sustenance and natural materials to end users (Wowor et al., 2023; Kaunang et al., 2024). Agribusiness is concerned with equipping and circulating the necessary resources for output, agricultural practices, improving cultivation techniques, refining goods, trading products, along with acquiring and disseminating merchandise (Saragih et al., 2007). Should any disturbances or limitations occur in any individual element down the line, the integrity of the entire network risks being jeopardized. Reflecting its operational purpose, the coconut agribusiness structure embodies an all-encompassing or individual functional

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entity integrating preliminary components, agricultural production, product refinement, promotional activities, and essential assistance (Hill & Jones, 2013).

Agroindustry as an industrial activity carried out individually or collectively by utilizing raw materials from agricultural products, to produce outputs in the form of semi-finished products or food products that have economic value and can answer the needs of food and nutrition consumption of living beings. A professional agroindustry actor has three interpersonal namely interpersonal roles, informational rules and decisional roles (Pinatik et al., 2024).

North Minahasa Regency is the second-largest coconut plantation center in North Sulawesi, with a coconut plantation area of 36,429 hectares in 2020 (BPS Provinsi Sulawesi Utara, 2021).Coconut is one of the plantation commodities that has strategic value in Indonesia (Haryanti & Marsono, 2021) . In addition to being a source of income for farmers, coconut is also a major raw material in various industries, including food, cosmetics, pharmaceuticals, and renewable energy (Hilda et al., 2024) . Indonesia is known as one of the largest coconut producers in the world, with potential for distribution across almost the entire archipelago (Hestina et al., 2022) . Among the coconut-producing regions, North Sulawesi Province holds an important position due to its significant coconut plantation area and its contribution to the regional economy.

In North Sulawesi Province, coconuts are not only viewed as a plantation commodity, but have also developed into a basis for the processing of creative food products with high added value. The creative industry using coconut as raw material produces a variety of products ranging from traditional coconut-based foods, virgin coconut oil (VCO), coconut flour, to various other derivative products (Salangga et al., 2022). The diversity of these products reflects the existence of great economic potential as well as opportunities to strengthen regional competitiveness at the national and international levels. Based on data, the coconut-based food sector in North Sulawesi is capable of generating a production value of IDR 714,540,357 annually and employing up to 79,791 people (Anonymous, 2023). These figures demonstrate the sector's tangible contribution to regional economic growth and improved community welfare.

Despite its great potential, the development of the coconut-based creative food industry still faces various obstacles (Mardesci & Fitriani, 2025) . Some of the problems encountered include limited business capital, minimal use of modern processing technology, inconsistent product quality, weak promotion and marketing systems, and difficulties in obtaining business legality (Hastuti et al., 2025; Mardesci & Fitriani, 2025). This situation has resulted in most businesses, particularly those in the Micro, Small, and Medium Enterprises (MSME) sector, being unable to

maximize the potential of coconut as a significant source of added value.

One important approach in measuring the performance of the coconut-based creative industry is added value analysis (Lawalata & Imimpia, 2020) . This analysis can provide information on the extent to which the processing process contributes to increasing the economic value of coconut raw materials, as well as how the benefits are distributed among business actors, workers, and other production factors. The results of added value analysis are important indicators for assessing business efficiency and product competitiveness in the market.

In addition, in the face of an increasingly competitive market, appropriate policy strategies are needed. These strategies must be able to optimize existing strengths, take advantage of opportunities, and minimize weaknesses and threats faced (Putri et al., 2022). Through SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, various alternative strategies relevant to the development of the coconut-based creative food industry can be generated. The right strategy is expected to increase production capacity, improve product quality, expand marketing networks, and encourage partnerships between business actors and the government and private sector.

This research is important to conduct in order to measure the extent to which coconut-based food agroindustry can increase the income of business actors and the regional economy in North Sulawesi Province. This understanding is supported and aligned with Porter, (1985), who emphasizes that added value is a source of competitive advantage, especially in industries based on natural resources that are innovatively processed in a region. The agroindustry of a region or area becomes important in reference to increasing the economic value of a commodity through processing, storage, distribution, and marketing. According to Hayami et al (1987), the added value obtained is the difference between the value of output and the value of intermediate inputs (raw materials and other inputs), reflecting the contribution of the production process to the income and welfare of business actors. In the context of coconut-based food industry, processing coconuts into derivative products such as coconut oil, VCO, instant coconut milk, coconut sugar.

The development of agro-industries based on regional superior commodities contributes to sustainable regional development through: increasing community income and economic diversification, as well as strengthening the regional industrial structure (Todaro & Smith, 2015).

In addition to the importance of researching and understanding added value, it is also crucial to identify the appropriate strategies for the development of the coconut-based food industry in North Sulawesi

Province in the future. According to David (2011), knowing the development strategy of an industry in a certain area aims to enhance competitiveness, sustainability, and economic performance. The strategy must consider internal factors (strengths and weaknesses) as well as external factors (opportunities and threats).

Based on this description, this study focuses on analyzing the added value of coconut-based food products and formulating development policy strategies in North Sulawesi Province. This study is expected to provide scientific contributions and practical recommendations that are useful for business actors, local governments, and other related parties in their efforts to strengthen the role of the coconut-based creative food industry as one of the main drivers of the regional economy.

## Method

### Time and Place

This research was conducted in several areas in North Sulawesi Province that are centers for coconut-based food businesses, namely North Minahasa Regency, South Minahasa Regency, Manado City, and Bitung City. The locations were selected purposively, considering that these areas have coconut processing activities managed by Micro, Small, and Medium Enterprises (MSMEs) and small-scale industries. The research lasted for six months, with the main activities including preliminary surveys, data collection, data analysis, and policy strategy development.

### Types and Sources of Data

The data used consisted of primary and secondary data. Primary data was obtained through direct observation, interviews, and the distribution of questionnaires to MSME business actors and coconut-based food industries. Secondary data was obtained from official publications of the Central Statistics Agency (BPS), relevant agencies, as well as literature and previous studies.

### Respondent Collection Techniques

Research respondents were determined using non-probability sampling through purposive sampling techniques. The respondents selected were business actors who actively process coconuts into creative food products, as well as parties with relevant knowledge of coconut agroindustry development.

### Analysis Methods

This study used two main analytical approaches, namely the Hayami (1987) method to calculate the added value of coconut-based food products (Sawitri, 2019) and SWOT analysis to formulate development

policy strategies. These two methods were chosen because they are able to provide a quantitative picture of the economic contribution of each processed coconut product while also qualitatively assessing the internal and external conditions that affect the competitiveness of the coconut-based creative industry in North Sulawesi Province.

|                                |  |
|--------------------------------|--|
| <b>Analysis of added value</b> | <ul style="list-style-type: none"> <li>• Performed using the Hayami method (1987). This method is used to calculate the amount of added value obtained from the coconut processing.</li> </ul> |
| <b>SWOT Analysis</b>           | <ul style="list-style-type: none"> <li>• Identify strengths and opportunities that can be maximized, as well as weaknesses and threats that must be minimized.</li> </ul>                      |

Research Flowchart

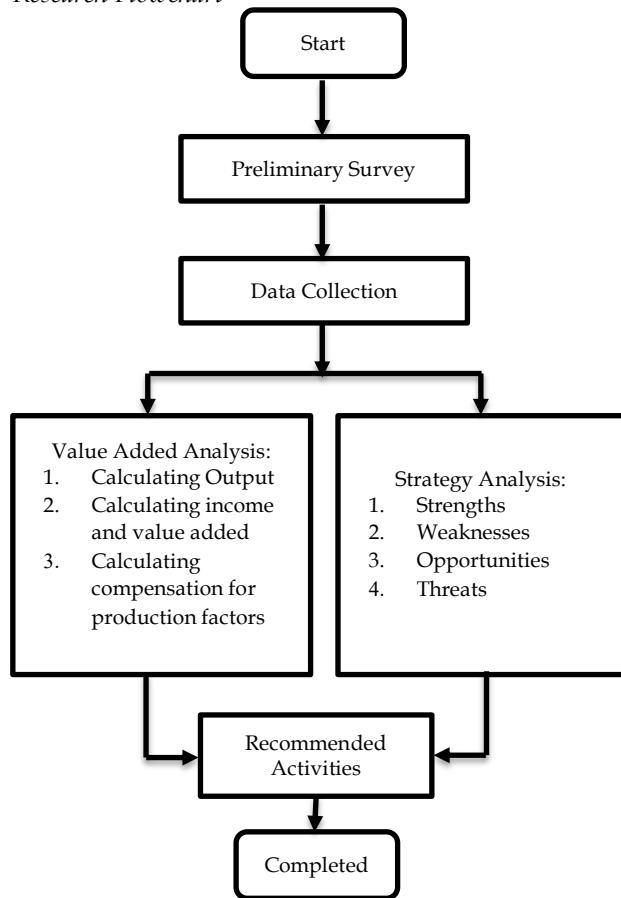


Figure 1. Flowchart of Research Stage

## Result and Discussion

### General Description of Coconut Production and Creative Industry Development in North Sulawesi

A general description of coconut production and the creative industry in North Sulawesi Province was obtained from interviews with a number of respondents at the research site, covering business experience characteristics, production capacity, and the number of

workers. The respondents who were interviewed are spread across the regencies and cities that produce coconut plants in North Sulawesi Province, namely

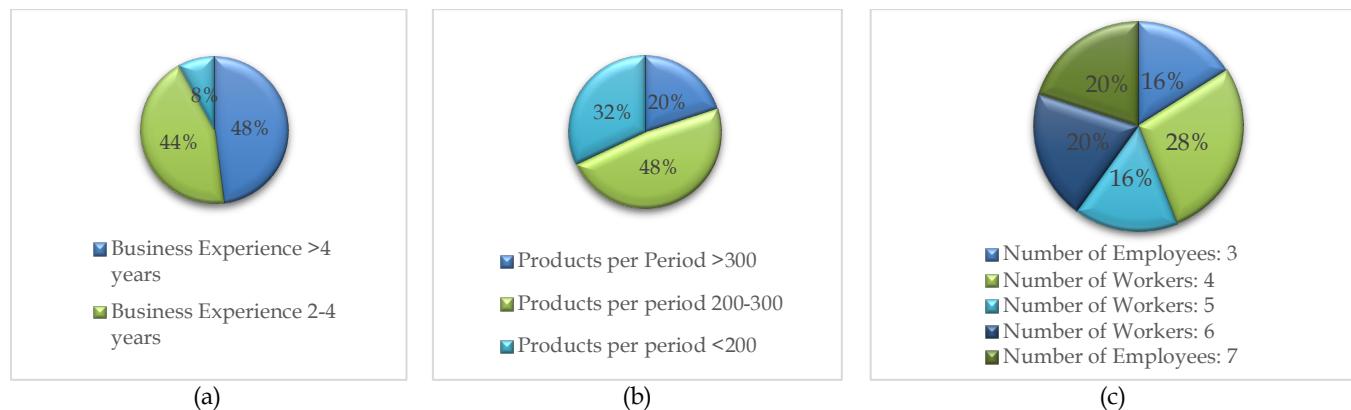
**Table 1.** Overview of coconut production

| Region         | Area      | Productivity   | Number of Business Units | Labor    | Output per Period |
|----------------|-----------|----------------|--------------------------|----------|-------------------|
|                | (ha)      | (Tons/Hectare) | (Unit)                   | (Person) | (Pcs)             |
| North Minahasa | 36,745.56 | 1,176          | 6                        | 30       | 1,500             |
| South Minahasa | 46,601.00 | 0.860          | 7                        | 35       | 1325              |
| Manado         | 2,481.00  | 1,341          | 6                        | 30       | 1830              |
| Bitung         | 14,055.81 | 0.814          | 6                        | 30       | 1505              |

Based on the coconut production potential in the four regions that were the locations of the study, the characteristics of respondents who are food business actors using coconut as raw material in the creative industry sector were obtained. Information about the

North Minahasa Regency, South Minahasa Regency, and the cities of Manado and Bitung, as shown in Table 1.

characteristics of these respondents plays an important role in the analysis of added value and the formulation of strategies for the development of the coconut-based creative food industry in North Sulawesi Province.



**Figure 2.** (a) Frequency distribution diagram of respondents' production experience, (b) Frequency distribution of production capacity, and (c) frequency distribution diagram based on labor

Work experience is the most influential factor in the growth of a business (Tupiti et al., 2022). Respondents with more than 4 years of experience accounted for 48% or 11 business units, respondents with 2 to 4 years of experience accounted for 44% or 11 business units, while respondents with less than 2 years of experience in the coconut-based food business accounted for 8% or 2 business units.

Production capacity is one of the important indicators that influence the value of a business's output (Maulida & Tholibin, 2021). Based on the research results, the production capacity of coconut-based food businesses in North Sulawesi Province shows significant variation. Twenty percent of respondents (4 business units) were able to produce more than 300 products per period, while 48% of respondents (12 business units) had a production capacity of between 200 and 300 products per period. Meanwhile, 32% of respondents (8 business units) produced less than 200 products per period, which illustrates the differences in production scale among businesses in the coconut-based creative industry sector.

In addition to production capacity, the number of workers also plays an important role in determining the production value of a business. Based on the results of the study, most coconut-based food businesses in North Sulawesi Province employ a relatively small number of workers, generally consisting of several family members or local workers. This condition shows that the coconut-based creative industry in the region is still dominated by small-scale businesses with a medium level of labor intensity. This is in line with the research (Wahyudi & Purwanti, 2021) which states that small-scale businesses in the local commodity-based food industry generally utilize family and community labor, so that the characteristics of the business tend to be labor-intensive but oriented towards increasing added value through simple processing. A similar study by (Hutabarat et al., 2020) also confirms that the involvement of local labor in the coconut-based industry has a significant contribution to rural labor absorption and regional economic improvement.

*Characteristics and Types of Creative Coconut-Based Food Products in North Sulawesi Province*

The identification of the grouping of types and characteristics of creative coconut-based food products based on the scale of MSMEs (Micro, Small, and Medium

Enterprises) consists of two types: culinary (wet and dry cakes made from coconut) and research and development (coconut oil and *virgin coconut oil* or VCO).

**Table 2.** Characteristics and Types of Creative Coconut-Based Food Products in North Sulawesi Province

| Types of Creative Food Products Made from Coconut | MSME Scale       |                 |                  |
|---|------------------|-----------------|------------------|
|   | Micro<br>(Units) | Small<br>(Unit) | Medium<br>(Unit) |
| Culinary  |                  |                 |                  |
| - Dry Cakes                                       | 16               | 12              | 8                |
| - Wet Cakes                                       | 32               | 15              | 10               |
| Research and Development:                         |                  |                 |                  |
| - Coconut Oil                                     | 16               | 7               | 8                |
| - Virgin Coconut Oil (VCO)                        | 8                | 13              | 1                |
| Total   | 72               | 47              | 27               |

The creative food industry using coconut as raw material in North Sulawesi Province is mostly run by micro-scale businesses. The most dominant type of business is dry pastry, with 16 units, followed by wet pastry, with 32 units, conventional coconut oil processing, with 16 units, and *virgin coconut oil* (VCO) production, with 8 units. Meanwhile, medium-scale businesses are relatively few in number and their distribution is not yet evenly spread across all districts and cities in the region.

The identification results show that business actors have the commitment and enthusiasm to continue developing creative food products made from coconut. The availability of abundant coconut raw materials in almost all regions is the main driving factor for coconut-

based food entrepreneurs ( ) to expand their production capacity and transform from a micro scale to a larger industrial scale (Kurniadinata & Rahman, 2025) (kurniadinata buku SS).

*Value Added Analysis*

According to (Sudaryanto, 2018) , calculating added value helps identify the advantages of coconut products and improve their position in the market. Another benefit of knowing the added value of a business is ensuring the efficient use of raw materials to increase profitability, and added value analysis encourages innovation in new coconut-based products. The added value analysis of a business's products generally uses the Hayami method (Intyasa, 2020).

**Table 3.** Value-Added Calculation Results

| Variable                     | Value       | Unit          | Notation         |
|------------------------------|-------------|---------------|------------------|
| Output                       | 880         | Products/Week | A                |
| Output                       | 6160        | Kg/Week       | B                |
| Raw Materials                | 125         | PHW/Week      | C                |
| Labor                        | 0.143       |               | D=A/B            |
| Conversion Factor            | 0.020       | PHW /Kg       | E=C/B            |
| Labor Coefficient            | IDR 250,000 | IDR/Liter     | F                |
| Output Price                 | IDR 150,000 | IDR/HOK       | G                |
| Average Labor Cost           |             |               |                  |
| Revenue and Added Value      | IDR 10,000  | IDR/Kg        | H                |
| Raw Material Price           | IDR 500     | IDR/Liter     | I                |
| Other Input Contributions    | IDR 35,714  | IDR/Liter     | J=DxF            |
| Output Value                 | IDR 25,214  | IDR/Liter     | K=J-I-H          |
| Added Value                  | 71          | %             | L = (K/J) x 100% |
| Value Added Ratio            | IDR 3044    | IDR/Kg        | M=ExG            |
| Labor Compensation           | 12          | %             | N = (M/K) x 100% |
| Labor Component              | IDR 22,170  | IDR/Liter     | O=K-M            |
| Profit                       | 88          | %             | P = (O/K) x 100% |
| Profit Margin                | IDR 25,714  | IDR/Liter     | Q=J-H            |
| Return on Production Factors | 86          | %             | R = (O/Q) x 100% |
| Profit Margin                | 12          | %             | S = (M/Q) x 100% |

Based on the calculations in Table 3, in the coconut-based food business as a leading industry in North Sulawesi Province, 25 MSME food businesses process coconuts into products, producing 880 products per week. To obtain these products, 6,160 kg of coconuts per week and 125 man-days per week of labor are required. The labor force is paid a daily wage of IDR 150,000 with a working capacity of 0.020 Man-Days (HOK) per kilogram. The average price of raw materials per kilogram is IDR 10,000, and the products are sold at an average price of IDR 250,000 per product.

The added value generated by each product from coconut raw materials in North Sulawesi Province is Rp 25,214, after deducting the raw material price per kilogram of Rp 10,000. The ratio of added value generated to the output value of Rp 35,714 per product is 71.00%. This value is then distributed as compensation for labor in the amount of Rp 3,044 per kilogram or 12%, so that the profit earned by MSME actors is Rp 22,170 per product. This means that the creative food industry activities using coconut raw materials managed by MSMEs above provide significant economic added value. This condition provides enthusiasm and

motivation to continue by designing a coconut-based food model as a leading creative industry in North Sulawesi Province.

The results of this study indicate that the development of the Coconut-Based Food Industry in North Sulawesi Province provides a tangible added value, achieving a high percentage in output and a large profit margin on coconut-based food products. These research findings are relevant to or in line with previous studies by Wulandari et al (2018) concerning the analysis of added value from the diversification of coconut products in Jambi Province and research on the added value of coconut sugar in Lampung Province (Lestari et al., 2021).

*Results of the Analysis of Strategies and Policies for the Use of the Coconut-Based Food System Model as a Leading Regional Creative Industry in North Sulawesi Province*

The results of the analysis of strategies and policies when using the coconut-based food system model as a leading regional creative industry in North Sulawesi Province, using SWOT analysis (*Strengths, Weaknesses, Opportunities, Threats*), can be seen in Table 4.

**Table 4.** SWOT Analysis Results

| Internal   | Strengths (S)<br>(Strengths)  | Weakness (W)<br>(Weaknesses)   |
|--|---|--|
| Opportunity (O)  |   |  |
| a. Wide market share, both locally, nationally and internationally                         | a. Coconut-based food products as a high-quality creative industry  | a. Technology (equipment and machinery) is still limited and unevenly distributed among coconut-based food businesses in North Sulawesi              |
| b. Providing employment opportunities for the people of North Sulawesi                     | b. Coconut-based food businesses as a creative industry in North Sulawesi have been operating for more than 2 years                   | b. Limited business capital at the individual or household business operator level   |
| c. Providing economic added value for business actors, both individuals/families and MSMEs | c. Coconut raw materials are abundant and continuously available in North Sulawesi  | c. Coconut-based food products are perishable or have a relatively short shelf life  |
| Attracting investors from outside North Sulawesi   | d. Business actors can produce coconut-based food products continuously, because coconut raw materials are abundant in North Sulawesi | d. The frequency of promotion of coconut-based food products by individual/family and MSME-scale business actors is still limited at the local level |
|  | a. Coconut-based food products are nutritious, healthy, and environmentally friendly  |  |
|  | S-O Strategy  | External   |
|  | a. Increasing the production of high-quality, internationally standardized products to expand the market                              | W-O Strategy   |
|  | b. Adding the latest technology, including equipment, processing machinery, and process technology                                    | a. Technology (equipment and machinery) is still limited and unevenly distributed among coconut-based food businesses in North Sulawesi              |
|  | c. Training skilled and reliable workers in the field of coconut-based food processing  | b. Increasing or improving business capital at the individual or family level and at the MSME level for coconut-based food products                  |
|  | d. Businesses can intensively and massively increase their sales targets for coconut-based food products on a continuous              | c. Adopting technology that can extend the shelf life of coconut-based food products   |
|  |   | d. Increasing the promotion of coconut-based food products on a massive scale,   |

| Internal  | Strengths (S)<br>(Strengths)                                   | Weakness (W)<br>(Weaknesses)  |
|---|--|---|
| Threats (T)<br>Threats<br>a. Cheaper and higher quality coconut-based food products entering the market from MSMEs and factories outside North Sulawesi<br>b. Food products made from other raw materials such as palm oil. | basis, as coconut raw materials are abundant in North Sulawesi | both online (using social media) and direct promotion to national and international markets |

Based on the results of the SWOT analysis, the creative coconut-based food industry in North Sulawesi Province has great potential to be developed as one of the region's leading sectors ( ). Its main strengths lie in the availability of abundant, high-quality coconut raw materials and the ability of business actors to produce a variety of high-value regional food products. However, there are still a number of obstacles, such as limited processing technology, lack of business capital, and limited promotional activities that hinder market expansion.

The results of the identification show that the most appropriate strategy to be implemented is a combination of the S-O (*Strength-Opportunity*) strategy and the W-O (*Weakness-Opportunity*) strategy. The S-O strategy focuses on utilizing internal strengths to maximize available market opportunities. Efforts that can be made include increasing production capacity and product quality, developing innovations and diversifying coconut-based food products, and optimizing training and the application of appropriate technology so that products can compete in national and international markets. In addition, partnerships between MSME actors and the private sector and government also need to be strengthened to expand distribution networks and open up wider market access.

Meanwhile, the W-O strategy is aimed at minimizing internal weaknesses by taking advantage of existing external opportunities. Some of the recommended steps include increasing access to modern technology and production equipment, strengthening business management and the financial capabilities of MSME players through mentoring and training, and increasing product promotion and branding activities both digitally and conventionally. Support from local governments is urgently needed, particularly in the provision of production facilities, capital assistance, and product promotion at the national and international levels. (Dzikrullah & Chasanah, 2024) also states that the success of MSMEs is largely determined by the role of the government and the efforts of the local community.

Overall, the results of this analysis confirm that the development of the coconut-based creative food industry in North Sulawesi Province is highly

dependent on collaboration between business actors, the government, educational institutions, and industry partners. The application of the combined S-O and W-O strategies is expected to drive increased added value, expand markets, and strengthen the position of coconut as a competitive commodity that contributes significantly to the regional economy.

## Conclusion

Added value analysis Coconut Raw Materials as a Creative Industry in North Sulawesi Province yielded an output value of IDR 250,000 per product, an added value of IDR 25,214 per product with a ratio of 71.00%, labor compensation of IDR 3,044 per kilogram or 12%, and a profit of IDR 22,170 per product or 88%. The appropriate policy strategy taken by business actors in maintaining and even developing coconut-based food businesses as a leading creative industry in North Sulawesi Province is a combination of S-O (*Strength-Opportunities*) and W-O (*Weakness-Opportunities*) approach, which involves continuously increasing the quantity and quality of coconut-based food products to meet consumer and market demands, through promotion or establishing partnerships with other parties, facilitated by the North Sulawesi Provincial Government.

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## Author Contributions

H.F.P.: Developing ideas, analyzing, writing, reviewing, responding to reviewers' comments; D.T., M.H.M., D.S., A.M.: analyzing data, overseeing data collection, reviewing scripts, and writing; M.K., T.K., R.K.: analyzing, reviewing scripts, and writing.

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## Conflicts of Interest

The authors declare no conflict of interest.

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