

Development Strategy of *Pondoh* Snake-fruit Processed Products in Yogyakarta, Indonesia

Triyono^{1,*}, Noor Iffhah Dwisusanti¹, Mamnuah ², and Mohd Fauzi Kamarudin³

¹ Department of Agribusiness, Faculty of Agriculture, Universitas Muhammadiyah Yogyakarta, Indonesia

² Department of Nursing Science, Faculty of Health Science, Universitas Aisyiyah Yogyakarta, Indonesia

³ Faculty of Technology Management and Technopreneurship, Universiti Teknikal Malaysia, Melaka, Malaysia

Abstract. Snake fruit is a tropical fruit native to Indonesia and considered a leading non-seasonal commodity suitable for continuous development. This study aims to formulate strategies for developing processed *pondoh* snake fruit products in the main production center of Yogyakarta. The research was conducted in Turi District, Sleman Regency, with samples consisting of home-based snake fruit processing industries, their owners, workers, and *pondoh* snake fruit farmer groups. Data was analyzed using SWOT analysis to assess internal and external factors influencing the processing business. Internal factors indicate that abundant raw materials, product innovation, and strategic location in tourist areas support business development, although limited promotion constrains market expansion. External factors reveal opportunities to utilize social media for marketing and benefit from government support to strengthen the local economy. The analysis results show that strengths outweigh weaknesses, while opportunities exceed threats, positioning the business strategy in quadrant I. Therefore, the recommended strategy involves collaboration with Baznas Sleman and Jogja Mark, enhancing marketing both offline and online, and promoting *pondoh* snake fruit MSMEs to support sustainable regional economic development.

1 Introduction

Humans initially created agriculture as a civilization in reaction to the difficulty of surviving, which is made more difficult by the depletion of natural food supply sources brought on by the rate of human expansion. Agricultural development in Indonesia is considered the most important in terms of economic development because the agricultural sector is the savior of the national economy [1]. One of the agriculture commodity that has an economic potential is snake fruit as a horticulture potential. The horticulture sub-sector is a sub-sector that has great potential in regional and national economic growth, because it has many benefits for improving nutrition, income and welfare of farmers.

* Corresponding author: triyono@umy.ac.id

There are various types of snake-fruit which are generally known by the name of the area where the snake-fruit is grown, such as snake-fruit *pondoh*, snake-fruit Bali, snake-fruit Padang, snake-fruit Madura and others. Snake-fruit *Pondoh* is a typical and superior plant that is widely cultivated in the Special Region of Yogyakarta Province, especially Sleman Regency.

Yogyakarta Province has 4 districts that are producers of snake-fruit *pondoh*. Sleman Regency ranks first with a production output of 544,880 quintals in 2022. Followed by Kulon Progo Regency as the second largest producer with a total of 32,996 quintals. Then Bantul Regency has 58 quintals and finally Gunungkidul Regency has 17 quintals in 2022 [4]. Statistical data shows that Kapanewon Turi was first in production in 2018 as many as 484,920.32 quintals [5]. This makes Kapanewon Turi have high potential in the development of snake-fruit *pondoh* commodities in Sleman Regency. Snake-fruit *Pondoh* in Sleman Regency has a sweet taste and a crispy texture.

Regarding initial observation, at the beginning of development, the selling value of snake-fruit *pondoh* was high in the 1990s. The price of snake-fruit *pondoh* at that time tended to be stable around IDR 10,000 – IDR 15,000. Meanwhile, at this time, the selling value of snake-fruit *pondoh* ranges from IDR 2,000 to IDR 3,000 per kilogram. The low selling value of snake-fruit *pondoh* is due to various factors, including competition with the production of snake-fruit *pondoh* outside the Sleman Regency area. This is exacerbated when the harvest in November makes the price of snake-fruit *pondoh* even more unstable which results in middlemen having a lot of snake-fruit stock, so middlemen limit the purchase of snake-fruit *pondoh*. As a result, farmers find it difficult to sell their snake-fruit and ignore the snake-fruit *pondoh* on trees that are ready to be sold.

Seeing this phenomenon, farmers and the community began to innovate by making processed products from snake-fruit *pondoh*. Processed snake-fruit *pondoh* in Turi District are geplak snake-fruit, dodol snake-fruit, jenang snake-fruit, snake-fruit syrup, snake-fruit candies, snake-fruit pia, snake-fruit diamonds and snake-fruit eggrolls. However, the production of processed snake-fruit *pondoh* is uncertain because processing depends on the order and the production place is still a small scale of households and in practice processors still have difficulty marketing processed snake-fruit *pondoh* products.

Based on the description mentioned above, this study discusses how the strategy for the development of processed snake-fruit *pondoh* as a leading commodity still exists in the midst of increasingly fierce business competition. The formulation of the strategy can be used as a reference for business actors in the development of a more innovative and competitive snake-fruit *pondoh* processed business.

Previous research on snake-fruit *pondoh* still emphasizes fresh production starting from the aspect of genetic diversity in seed development, techniques and methods of snake-fruit *pondoh* cultivation, and fertilization technology [4]. Meanwhile, most previous studies about *sallaca* post-harvesting focus on fresh fruit marketing, export by collaborating with entrepreneurs and farmers, and post-harvest handling to meet global market standards, by preserving the quality of Snake-fruit *Pondoh* during storage, including maintaining its physico-chemical properties, various packaging and storage methods. Agri-food SMEs primarily utilize vertical scaling through partnerships and collaborations, and horizontal scaling via market demand stimulation and product diversification [5]. In terms of the use of digital technology, especially AI, it has been applied in farm management, precision agriculture and product processing [6]. However, we have not found the integration of marketing collaboration with agro-tourism activities with the use of information technology, especially social media platforms. Therefore, the study of snake-fruit *pondoh* in various processed products that are integrated with agrotourism activities, is a new strategy for the development of added value and the expansion of market segments. This can be an alternative in dealing with obstacles related to market and export dynamics through the development of

domestic market segments rather than international market competition. In addition, it is expected to increase women's participation in rural tourism management.

2 Research method

This research method uses descriptive methods and quantitative methods. This research was conducted in Kapanewon Turi, Sleman Regency. The three snake-fruit *pondoh* processing businesses as samples are Diamond MSMEs, Viva MSMEs, and the Kusuma Mulya Farmers Group. Diamond MSMEs produce processed snake-fruit *geplak* snake-fruit and *jenang* snake-fruit. Meanwhile, Viva MSMEs produces processed snake-fruit pia and snake-fruit eggrolls. The location determination was carried out deliberately (purpose) with the consideration that Turi District is the production center of one of the ponds in Kapanewon in Sleman Regency and even Yogyakarta.

The strategy employed in establishing the *pondoh* snake fruit processing enterprise is SWOT analysis. SWOT analysis aims to identify the strengths, weaknesses, opportunities, and threats that influence a company's performance. Internal information regarding strengths and weaknesses is acquired from stakeholders within the company, including owners, managers, and employees. External information regarding opportunities and threats can be sourced from customers, governmental documents, suppliers, financial institutions, and other corporations.

The analysis used in determining this development strategy consists of 2 stages, namely the data collection stage and the data matching stage. The data collection stage is in the form of an overview of the situation and condition of MSMEs using Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE). Factor evaluation based on the analysis of respondents resulted in a factor weight value [7] Furthermore, in the second stage, the data match is using a SWOT matrix. The matrix is in the form of an SO (Strenght-Opportunity), WO (Weakness-Opportunities), ST (Strenght-Threat) strategy, and WT (Weakness-Threat) strategy [8].

3 Results and discussion

3.1 Strategies for the development of processed snake-fruit *pondoh* products

3.1.1 Stages of data collection

3.1.1.1 Identification of internal and external factors

In the preparation of internal factors, there are strengths and weaknesses (Table 1). For the arrangement of external factors, there are opportunities and threats (Table 2). Preparation of internal factors and external factors obtained from observations and interviews with farmer groups, owners and workers. The identification results showed that internal conditions consisted of six strength factors and four weakness factors. Meanwhile, external conditions consist of five opportunity factors and four threat factors. This condition illustrates the potential for businesses to be developed. The potential is related to the availability of resources, innovations and available facilities can be used in dealing with financial problems, the challenge of adapting to market changes in order to achieve the company's business goals in a holistic [9].

Table 1. Identification of Internal Factors in the form of Strengths and Weaknesses

Strength	Information
1	There is easy road access
2	It is located in a tourist area
3	It offers many innovations in processed snake-fruit <i>pondoh</i>
4	Raw materials abound
5	It has high nutritional value
6	Many stores that sell processed products
Weakness	
1	It has Lack of promotion
2	It cannot be produced directly yet
3	It is Not yet able to market widely
4	It is Still using simple tools

Table 2. Identification of External Factors in the form of Opportunities and Threats

Opportunity	Information
1	There are many online product marketing platform
2	There is market product access to tourist areas
3	There is support from the government
4	It can help the economy of the surrounding community
5	There are many tourisms Visit
Threat	
1	It occurred competition for products from outside
2	There is no regular market yet
3	The price of additives is increasing
4	Miscellaneous costs increase

3.1.1.2 Analysis of internal and external factors

The preparation of the IFE and EFE matrix is carried out by assessing the weights and ratings of each internal and external factor. The weighting obtained is based on the division of the average number of internal and external factors with the average score of internal and external strategies. Furthermore, in determining the overall score from both internal and external factors, it is determined based on the weight and rating of the questionnaire that has been distributed to 15 respondents.

Internal evaluation is something that needs to be considered in the development of tourism villages, including processed products that are promoted for visitors. The internal condition of the processed snake-fruit *pondoh* product business has strengths and weaknesses. Strength in the processed business can be interpreted as the condition of the company being able to carry out tasks and manage resources effectively. On the other hand, the weakness is a condition in which the snake-fruit *pondoh* processing business still has shortcomings in developing its potential optimally due to limited resources.

Based on the Internal Factor Evaluation (IFE) matrix in Table 3, there is the most dominant strength factor, namely being in tourist areas and having stores selling processed products with a value of 0.39. This means that the snake-fruit *pondoh* processing business should maximize the condition of the area in the tourist area. The existence of a product sales store can make it easier to sell products. In addition, it can be an attraction for tourists to visit the snake-fruit *pondoh* processed business to buy souvenirs of processed snake-fruit *pondoh* products. Meanwhile, the most dominant weakness factor is the lack of promotion with a value of 0.35. This means that the processed business is still lacking in promoting processed snake-fruit *pondoh* products. This has an effect on the development of the snake-fruit *pondoh*

processed business. The promotions carried out must keep up with the times. That way, the processed snake-fruit *pondoh* business can improve and maximize processed snake-fruit *pondoh* products and can affect business branding in the future. The total value of the IFE matrix is 1.06. Thus, it can be concluded that the internal conditions are in a strong position.

Table 3. Matriks of Internal Factor Evaluation (IFE)

Strength	Information	Weight	Rating	Value
1	There is easy road access	0.10	3.33	0.34
2	It is located in a tourist area	0.11	3.60	0.39
3	It offers many innovations in processed snake-fruit <i>pondoh</i>	0.11	3.47	0.37
4	Raw materials abound	0.11	3.53	0.38
5	It has high nutritional value	0.10	3.27	0.32
6	Many stores that sell processed products	0.11	3.60	0.39
Weakness				
1	It has Lack of promotion	0.10	3.40	0.35
2	It cannot be produced directly yet	0.08	2.60	0.21
3	It is Not yet able to market widely	0.10	3.33	0.34
4	It is still using simple tools	0.08	2.73	0.23
Total		1.00		1.06

Being located in a tourist area is a significant strength for the Snake-fruit *Pondoh* processing business. This strategic location can attract a steady flow of tourists who are potential customers for the processed products. The presence of tourists can enhance sales and visibility, making it a critical factor to maximize. Meanwhile, having a dedicated shop for selling processed products is another strength. This setup allows for direct interaction with customers, better control over product presentation, and the ability to create a unique shopping experience that can appeal to tourists [10].

The most dominant weakness identified is the lack of promotion, with a value of 0.35. Effective promotion is crucial for attracting both tourists and locals. The business needs to adopt modern promotional strategies to stay relevant and competitive. This includes leveraging digital marketing, social media, and other contemporary advertising methods to reach a broader audience. The Internal Factor Evaluation (IFE) matrix value of 1.06 indicates that the business has more strengths than weaknesses, but there is still significant room for improvement. Therefore, it is necessary to strengthen the entrepreneurial characteristics of the community so that they have the ability to network cooperation, initiatives and problem solving.

The condition of external factors presented data in the form of opportunities and threats. Opportunities are possibilities that can occur and are used by companies to plan an accurate strategy. Meanwhile, threats are obstacles experienced by companies that result in hindering the company's development. Based on the External Factor Evaluation (EFE) matrix in Table 4, the most dominant opportunity factor is online product marketing with a value of 0.45. This means that the snake-fruit *pondoh* processed business has a great opportunity to market its products online. Online product marketing can be done on social media and online marketplaces in Indonesia. Online marketing is also one of the most effective because it can reach a wider audience, lower marketing costs, increase consumer engagement and awareness of the brand, increase sales and revenue success, and make it easier to find the right target market. Meanwhile, the most dominant threat factor is competition from outside products with a value of 0.38. This means that the snake-fruit processed business can anticipate competition from outside products by making innovations in processed snake-fruit *pondoh* products. Product innovation must be carried out because it can improve product quality, product development and increase product efficiency. Thus, the processed snake-fruit *pondoh* business can develop and maintain the continuity of the processed snake-fruit

pondoh business in the future. The total value of the EFE matrix is 0.67. Therefore, internal conditions can be concluded that external factors are in a strong position.

Table 4. Matrix External Factor Evaluation (EFE)

Opportunity	Information	Weight	Rating	Nilai
1	There are many online product marketing platform	0.12	3.73	0.45
2	There is market product access to tourist areas	0.11	3.27	0.35
3	There is support from the government	0.12	3.67	0.44
4	It can help the economy of the surrounding community	0.12	3.60	0.42
5	There are many tourism Visit	0.11	3.47	0.39
Threat				
1	It is occurred competition for products from outside	0.11	3.40	0.38
2	There is no regular market yet	0.10	3.00	0.29
3	The price of additives is increasing	0.11	3.27	0.35
4	Miscellaneous costs increase	0.11	3.33	0.36
Total		1.00		0.67

This is supported by several abstracts that highlight the significance of digital marketing in expanding business reach and improving performance. Digital marketing is crucial for business expansion as it connects with a vast number of potential customers online. It involves strategies like social media content, pay-per-click advertising, and SEO to attract and engage customers [11]. Online marketing significantly impacts the performance of SMEs by improving both external and internal communication, which is essential for business success [12].

Product competition from outside is the most dominant threat factor with a value of 0.38. This is a common challenge for businesses, as highlighted in the abstracts. Product market competition can negatively affect firm performance, especially in developing economies where it can lead to increased corruption and financial strain. To counter competition, firms often need to innovate, improving product quality and reducing costs to maintain competitiveness [13]. Companies can respond to competition by acquiring more resources, seeking government support, and adopting quality improvement policies [14].

The total value of the EFE matrix is 0.67, which indicates the overall effectiveness of the business in responding to external opportunities and threats. This value suggests that while there are significant opportunities, the threats also pose considerable challenges. The abstracts provide insights into how businesses can strategically navigate these factors. Innovating snake-fruit *pondoh* processed products can be a strategic response to external competition. Innovation helps in differentiating products and maintaining market relevance [13]. After recapitulation of the values of both internal (IFE) and external (EFE) factors, the next stage is to bring together the X axis and the Y axis in a SWOT quadrant diagram. The X axis represents IFE, the Y axis represents EFE.

From the four strategies, they were then selected based on the SWOT quadrant. The first step is to make the quadrant divided into 4 positions. Quadrant I shows the company in the S-O strategy (strengths-opportunities), quadrant II in the position of the W-O strategy (weakness-opportunities), quadrant III is in the W-T strategy (weakness-threats), and quadrant IV is in the S-T strategy (strengths-threats). For the second step, it is to determine the coordinates of the x-axis and the y-axis where the x-axis is the total weight score value of the IFE matrix, while the y-axis is the total weight score value of the EFE matrix with the center axis (X = 1.06; Y = 0.67). Based on the SWOT quadrant in Figure 1, the position obtained is in quadrant I. This means that the development strategy of processed snake-fruit *pondoh* emphasizes the condition of strength and opportunities faced by the company.

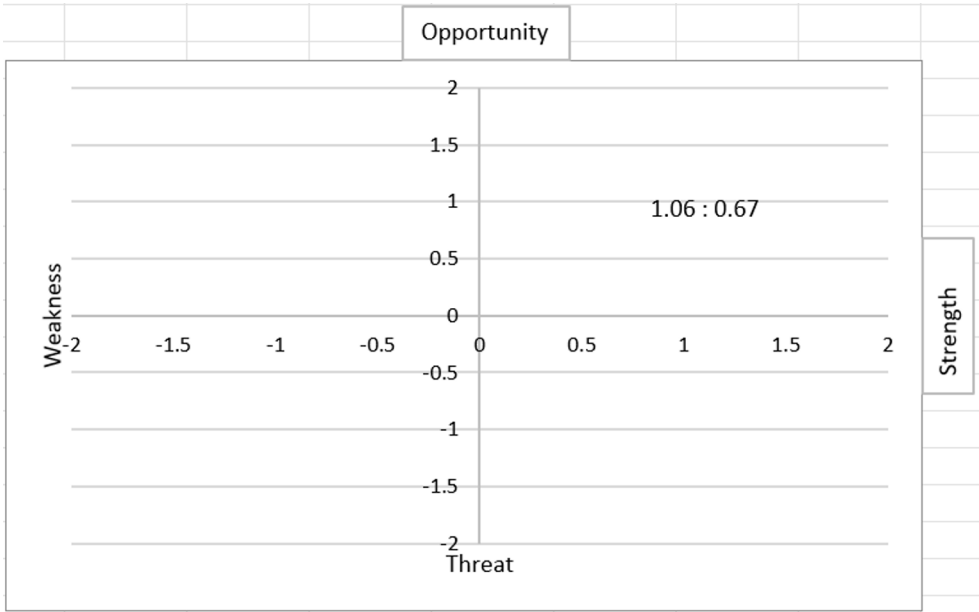


Fig 1. Quadrant of SWOT analysis

3.1.2 Data matching stage

Strategy design with a SWOT matrix is carried out based on analysis on the IFE matrix and the EFE matrix by matching opportunity and threat factors with strength and weakness factors. The use of a SWOT matrix aims to identify as many alternative strategies as possible that can be needed by business actors. This matrix consists of four types of strategies, namely the S-O strategy (maximizing strengths to take advantage of opportunities), W-O strategies (overcoming weaknesses to take advantage of opportunities), S-T strategies (using strengths to face threats), and W-T strategies (overcoming weaknesses in the face of threats).

3.1.2.1 S-O strategy (strength-opportunity)

- a. Collaboration with Baznas Sleman and Jogja Mark for business development. In this case, the processed snake-fruit *pondoh* business receives support related to capital, business guidance, co-branding and government policies in developing businesses. In addition, it invites the community to make the most of the potential of the existing area.
- b. Marketing of processed products both offline and online. This needs to be considered because it can be one of the factors for the development of processed businesses, especially in terms of increasing product sales. Online marketing can be done on social media and e-commerce. E-commerce is an easy-to-use social media. E-commerce helps in reducing operational costs by speeding up transaction processes and minimizing human errors. This includes reducing the use of paper in various activities from designing to marketing. SMEs adopting e-commerce have reported benefits such as gaining more customers and increasing sales.
- c. Promotion to MSMEs processed snake-fruit *pondoh*. Promotions are carried out to support sales. This is being done to increase visits so that tourists shop for processed products. Utilization e-commerce allows SMEs to market their products to a broader audience, including international markets, which is crucial for their growth and competitiveness.

3.1.2.2 S-T strategy (strength-threat)

- a. Improving product quality, market research and branding. This must be pursued because it can increase the business of processed snake-fruit *pondoh* products. The things obtained include the latest information such as processed product innovations from snake-fruit, business trends, market trends, consumer awareness of brands, and consumer desires as well as building a positive image of processed businesses and can be known to a wide audience and efforts are needed that can increase business competitiveness.

Table 5. SWOT Matrix

Internal Factors External Factors	Strengths 1. There is easy road access 2. It is located in a tourist area 3. It offers many innovations in processed snake-fruit <i>pondoh</i> 4. Raw materials abound 5. Has high nutritional value 6. Many stores that sells processed products	Weaknesses 1. It has lack of promotion 2. It cannot be produced directly yet 3. It is not yet able to market widely 1. It is still using simple tools
	Opportunities 1. There are many online product marketing platforms 2. There is market product access to tourist areas 3. There is support from the government (Baznas, Market) 4. It can help the economy of the surrounding community 5. There are many tourism Visit	S-O Strategy 1. Collaboration with Baznas Sleman and Jogja Mark for business development (S3, S4, S5, S6, O3, O4) 2. Marketing processed products both offline and online (S2, S6, O1, O2) 1. Promotion was carried out on MSMEs processed snake-fruit <i>pondoh</i> (S1, S2, O5)
	Threats 1. It is occurred competition for products from outside 2. There is no regular market yet 3. The price of additives increases 1. Miscellaneous prices increase	W-O Strategy 1. Promoting processed products through social media (W1, W2, W3, W4, O1) 1. Switch to modern tools to maximize production (W4, O3)
	S-T Strategy 1. Improving product quality, market research and branding (S2, S3, S5, T1, T2)	W-T Strategy 1. Increase product promotion and innovate new processed products (W1, W3, T1)

3.1.2.3 W-O strategy (weakness-opportunity)

- a. Promoting processed products through social media. At this time, social media is one of the effective media to promote products because it can save promotional costs in addition to increasing consumer awareness of the brand, reaching a wide range of consumers, being able to interact with consumers, and getting the latest promotional trends. With this effort, it is hoped that it can develop the business of processed snake-fruit *pondoh* products.

- b. Switch to using modern tools to maximize production. The use of modern tools is carried out with the aim of time and energy efficiency in the production process of processed snake-fruit *pondoh*.

3.1.2.4 W-T strategy (weakness-threat)

- a. Increase product promotion and make new innovations of processed products. It is done by making various efforts creatively to promote the product. In addition, new innovations are needed for processed products that have advantages or uniqueness from other products in order to attract consumers.

Based on the analysis of the internal factor matrix, external factors and SWOT analysis in Table 5, the development strategy of processed snake-fruit *pondoh* emphasizes quadrant 1. The position in quadrant I of the SWOT analysis for developing processed snake-fruit *pondoh* emphasizes leveraging the company's strengths and opportunities including a). Cooperation with Baznas Sleman and Jogja Mark for business development, b). Marketing of processed products both offline and online, c). Promotion of processed snake-fruit *pondoh* MSMEs. By focusing on strategic marketing, exploring new markets, innovating products, forming collaborations, and utilizing online sales channels, the company can enhance its growth and success in the competitive market. In addition, partnering with restaurants, hotels and shopping centers is a strategy that needs to be considered [15].

4 Conclusion and recommendation

Using SWOT analysis in this study, 4 alternative strategies were produced, namely S-O (Collaboration with Baznas Sleman and Jogja Mark, marketing processed products both offline and online, and promoting MSMEs in snake-fruit *pondoh* processed businesses), S-T strategy (Improving product quality, market research and branding), W-O strategy (Promoting processed products through social media and switching to using modern tools to maximize production) and W-T strategy (Increase product promotion and make new innovations of processed products). The snake-fruit processing business will use the S-O strategy. This is based on the position of the processed snake-fruit *pondoh* business in the SWOT quadrant which is in quadrant I. in collaboration with Baznas Sleman and Jogja Mark, marketing processed products both offline and online and promoting MSMEs processed snake-fruit *pondoh*.

Based on the results of the SWOT matrix analysis, the development strategy prioritizes the SO strategy, namely cooperation with Baznas Sleman and Jogja Mark, marketing processed products both offline and online and promoting processed snake-fruit *pondoh* MSMEs. This can be used as a reference in the development of the snake-fruit *pondoh* processed business in the future and can be used as a comparison for future research. Thus, it can detect the existing potential to be developed optimally, and can optimize processed businesses, resources and attract tourists to visit and shop at the processed snake-fruit *pondoh* business in Turi District.

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