

DOWNSTREAM STRATEGIES OF LIQUID SMOKE PRODUCTS AS A PRESERVATIVE AND SMOKE AROMA IN FISHERY PRODUCTS

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Abstract

Smoked fish is a fishery product that meets the nutritional needs of the population. The traditional smoking method leads to the production of H₂S, which reduces the aroma and is carcinogenic. The liquid smoke technology offers a solution to the challenges associated with the application of traditional smoking methods. However, the use of the liquid smoke method remains limited in smoked fish businesses. This study aimed to evaluate and develop a downstream strategy for producing and distributing liquid smoke to facilitate its implementation by smoked fish businesses based on strengths, weaknesses, opportunities, and threats (SWOT) analysis. This study employed a quantitative descriptive methodology utilizing the SWOT analytical framework. The data were collected through interviews and questionnaires. The obtained data were subjected to weight calculations using the Expert Choice tool. The research findings indicate that the optimal approach for developing downstream liquid smoke products is to create a novel product in the form of liquid smoked fish. Liquid-smoked fish are immersed in or coated with liquid smoke to achieve an extended shelf life and smoky aroma, without traditional smoking methods. In addition, it establishes a strategic alliance between scholars, entrepreneurs, and the government. Strategic relationships can be established by developing a shared agenda focusing on fostering a sustainable blue economy. The blue economy refers to the use of hygienic, healthy, and non-carcinogenic fishing products such as smoked fish to promote sustainable economic growth and enhance community welfare.

Keywords: blue economy, collaboration, smoked fish, SWOT, traditional smoking method

Strategi Hilirisasi Produk Asap Cair sebagai Pengawet dan Aroma Asap pada Produk Perikanan

Abstrak

Ikan asap adalah salah satu produk hasil perikanan yang berperan dalam pemenuhan gizi masyarakat. Proses pengasapan secara tradisional menyebabkan pembentukan hidrogen sulfida (H₂S) yang merusak aroma dan bersifat karsinogenik. Teknologi asap cair menjadi solusi dari permasalahan penerapan pengasapan tradisional. Namun, teknologi asap cair ini belum banyak di terapkan oleh pengasap ikan terutama pengusaha pengasapan ikan. Penelitian ini bertujuan untuk mengevaluasi dan menyusun strategi hilirisasi produk asap cair agar dapat diterapkan oleh pengusaha pengasap ikan berdasarkan analisis *strength*,

weakness, opportunity, dan threats (SWOT). Penelitian ini menggunakan metode deskriptif kuantitatif, dengan pendekatan SWOT analisis. Teknik pengumpulan data dilakukan melalui wawancara dan kuesioner. Data hasil diolah melalui perhitungan bobot dengan alat bantu Expert Choice. Hasil penelitian menunjukkan bahwa strategi hilirisasi produk asap cair adalah dengan menciptakan produk baru berupa ikan asap cair. Ikan asap cair diolah melalui perendaman maupun penyemprotan asap cair sehingga produk ikan awet dan memiliki aroma asap tanpa melalui pengasapan tradisional serta membentuk kemitraan strategis antara akademisi-pebisnis dan pemerintah. Kemitraan strategis dapat berjalan dengan penyusunan agenda yang memiliki tujuan bersama, yaitu terciptanya keberlanjutan ekonomi biru. Ekonomi biru diartikan sebagai peningkatan kesejahteraan masyarakat melalui pemanfaatan hasil perikanan berupa ikan asap yang higienis, sehat dan tidak bersifat karsinogenik sebagai sumber pertumbuhan ekonomi berkelanjutan.

Kata kunci: ekonomi biru, ikan asap, kolaborasi, pengasapan tradisional, SWOT

INTRODUCTION

Smoked fish is a fishery product that contributes to meeting the nutritional needs of the population. Quality-smoked fish have high selling value in the market. In Indonesia, the production of smoked fish has reached 66,970 tons (Dotulong *et al.*, 2018). Based on the proximate analysis, the smoked fish product had a protein content of 34.04-45.28% (Ilhamdy *et al.*, 2022) and 59.48% (Rakhmayeni *et al.*, 2024). According to Suryandari & Widyastuti (2015), the animal protein required by the human body is between 20% and 40% of the total protein requirements. Therefore, many people consume smoked fish to meet their nutritional requirements.

Traditional smoking methods for producing smoked fish often neglect sanitation and hygiene. They have the potential to harm human health and the environment. A typical environmental consequence of the traditional smoked fish method is smoke emission, which leads to air pollution (Shoimah *et al.*, 2013; Haryati, 2020). The traditional smoking method leads to the formation of H₂S, which destroys aroma. In addition, there is a concern that traditional smoking can lead to the formation of carcinogenic chemicals, namely PAHs, during the smoking process (Swastawati *et al.*, 2018). PAHs are polycyclic aromatic hydrocarbon compounds (Edward 2018). Human exposure to PAHs can occur through inhalation, mouth absorption, and skin absorption. PAHs present in air particles with a diameter of less than 10 µm (PM10) can breathe and subsequently accumulate in the human respiratory system, leading to adverse health effects (Sari *et al.*, 2020). Traditional fish smoking contributes to environmental degradation by emitting air pollutants that can

lead to respiratory issues (Widodo *et al.*, 2023). The liquid smoke approach was developed to solve problems resulting from the traditional method (Leiwakabessy & Wenno, 2018; Leiwakabessy & Wenno, 2019).

Liquid smoke is a solution derived from the dry distillation of certain materials, such as corncobs, coconut shells, and wood (Erdiman *et al.*, 2022). Liquid smoke is an innovative technology that helps prevent the harmful effects of carcinogens. It also serves as an eco-friendly approach to smoking fish. Its primary function is to provide smoke flavor and aroma (Swastawati *et al.*, 2019). However, this technique has not been extensively adopted by fish smoking businesses. This is one of the obstacles in downstream liquid smoke products as a solution to the negative effects of traditional fumigation. Previous studies have discussed the benefits of applying and determining the concentration of liquid smoke. One of the methods involves the use of 10% liquid smoke derived from rubberwood with a soaking time of 15 min (Suroso *et al.*, 2018). Prior studies have also examined the impact of including only the specific type and concentration of liquid smoke (Swastawati *et al.*, 2018). Interviews were conducted to investigate the experimental application of liquid smoke to smoked fish in order to create high-quality products suitable for export. The study was conducted using PT. Satu Sahabat Jawanis. Therefore, investigations of liquid smoke remain limited to laboratory settings, resulting in a lack of widespread awareness and utilization of liquid smoke products. Therefore, it is important to develop strategies downstream of liquid smoke products.

Downstream refers to the transformation of raw materials into final

items through an industrialized process. The downstream product is a supporting activity in Indonesia's fisheries development strategy. Technological downstream, as defined by Siegel *et al.* (1995), refers to the conversion of laboratory-scale technological inventions in the form of prototypes into commercially viable products that are mass produced and traded for profit and income (Ekwarso *et al.*, 2022). Downstream refers to the practical application of research findings to make them accessible and beneficial to the public. However, the utilization of liquid smoke technology for smoked fish businesses and society is limited owing to many challenges in the downstream process. The downstream process encounters several obstacles: (i) limited public awareness of liquid smoke products; (ii) lack of knowledge among fish smoking businesses regarding the application of liquid smoke to fish; (iii) limited access to liquid smoke products; and (iv) capital constraints faced by fish smoking business in producing smoked fish using liquid smoke. This research aimed to evaluate and develop a downstream strategy for producing and distributing liquid smoke to facilitate its implementation by smoked fish businesses.

MATERIALS AND METHOD

Location and Time

Field observations were carried out from August to November 2023. The study was conducted at two locations: the Semarang City fish fumigation center in Bandarharjo Subdistrict, North Semarang District, and PT. Satu Sahabat Jawanis (SSJ) in Rembang.

Data Collection

The study employed a quantitative descriptive methodology utilizing the strengths, weaknesses, opportunities, and threats (SWOT) analysis framework (Mashuri & Nurjannah, 2020). The data were collected through interviews and questionnaires. The obtained data were subjected to weight calculations using the Expert Choice tool version 11.A total of 51 respondents were selected using a purposive sampling technique to gather data from relevant stakeholders, including traditional smoked

fish entrepreneurs; communities residing near the fish auction place; and related agencies such as fisheries and maritime services, industry and trade services, and micro, small, and medium enterprises (MSMEs). PTs were the manufacturers involved in this study, SSJ Rembang and PT. Asap Cair Multiguna (ACM). The selection of participants was determined according to these criteria. (1) The respondents were individuals who possessed knowledge regarding smoked fish products and their processing; (2) The informants were knowledgeable about liquid smoke; (3) The respondents were producers of liquid smoked fish; and (4) The informants have the authority to determine business strategy policies for fishery products.

The sample size was determined based on understanding and knowledge of smoked fish and liquid smoke. Total respondents included: (1) Traditional smoked fish entrepreneurs 20 people, (2) Community around the Fish Auction Place = 5 people, (3) Fisheries and Maritime Service = 3 people, (4) Department of Industry, Trade and Micro, Small and Medium Enterprises = 3 people, (5) PT. SSJ Rembang = 10 people, and (6) PT. Asap Cair Multiguna (ACM) = 10 people.

Data Analysis

SWOT analysis is a tool used for strategic planning and strategic management in organizations (Gurel & Tat, 2017). SWOT Analysis involves four areas into two dimensions. Strengths and weaknesses are internal factors and attributes of opportunities and threats are external factors. Strategic internal factors were evaluated by assigning weights (a) and conducting assessments (b) based on established criteria. The score value was obtained by multiplying the weight and assessment using the formula $\text{score} = \text{weight} \times \text{assessment} = (a) \times (b)$. The weight and evaluation of each strategic aspect were established with the input of respondents/informants who were provided with questionnaires or interviewed.

RESULTS AND DISCUSSION

The strategy for downstream liquid smoke technology is designed to increase the

application of liquid smoke to fishery products to ensure the products are hygienic and safe for the environment and consumer health. Strategies for sustainable fishery products were carried out using SWOT analysis. SWOT analysis involves four components divided into two categories: internal factors and external factors. These components include strengths and weaknesses, which fall into the internal factors category, while opportunities and threats fall into the external factors category (Gurel & Tat, 2017).

Internal Factors

Power is a capability or ability that has an impact or positive value. The objective is to thoroughly optimize this sector to provide a comprehensive downstream plan for liquid smoke products (Deddy *et al.*, 2023). In contrast to strengths, weakness components in a downstream strategy can cause threats to arise. Table 1 presents The Internal Factor Analysis Summary (IFAS) matrix. The overall strength score amounted to 3.35. The overall value for the strength aspect in each IFAS matrix was 2.82, while the weakness was 0.54.

External Factors

Opportunities and threats are the components of external factors in developing a downstream strategy. The External Factor Analysis Summary (EFAS) matrix is presented in Table 2. The subtotal score for opportunities was 3.08, while the score for threats was 0.08. Therefore, the total score for the EFAS matrix was 3.43.

IFAS-EFAS Grand Strategy Matrix

Based on the results of factor analysis data processing, the internal factor matrix (IFAS) was found with a total of 3.35 (Table 1), while the external factor matrix (EFAS) was found with a total of 3.43 (Table 2). After finding the data processing results from IFAS and EFAS, they are then placed in the Wheelen matrix which consists of nine quadrants (Quadrants I – IX) to obtain the coordinate points (3.35; 3.43). This coordinate point turns out to be located in quadrant I, which means the business is in the “Growth” position. According to Rangkuti

(2013), this position is designed to achieve growth, whether in sales, assets, profits, or a combination of the three. This strategy can develop new products, increase product or service quality, and minimize prices. Based on research findings and SWOT analysis results, the strategic position of the business is in the “Growth” quadrant (Figure 1).

SWOT Matrix

The recommendations for strategies to implement liquid smoke products as an application of fishery product technology were developed by analyzing the variables that contribute to strengths, weaknesses, opportunities, and threats (Table 3). The SWOT analysis yielded 26 strategies, comprising 16 SO (Strength Opportunities) strategies, 3 WO (Weakness Opportunities) strategies, 6 ST (Strength Threats) strategies, and 1 WT (Weakness Threats) strategy.

The liquid smoke technology produced independently by PT. ACM did not have a relevant downstream strategy. The absence of collaborations between MSMEs and fish smoking enterprise, whether at the individual level or in large-scale manufacturing, is the primary reason for ineffective marketing strategies, resulting in the underutilization of liquid smoke technology. Strengthening partnerships can be achieved by increasing raw materials supply, developing supply chain and distribution networks, and strengthening market information systems and efficient production. Partnership development is a strategy to guarantee business continuity (Nainggolan *et al.*, 2019). Failure to establish partnerships will impede the marketing process, preventing the development of the downstream liquid smoke product.

Liquid smoke, as a product, requires a supporting tool for its application, namely an oven. This can be inconvenient for small-scale producers. Therefore, executing a strategic plan grounded in a thorough SWOT analysis is crucial. The first strategy is involves creating a novel product innovation in the form of liquid-smoked fish. The advantages of utilizing liquid smoke are readily experienced by consumers, particularly those without access to an oven. An alternative approach is

Table 1 IFAS Matrix
Tabel 1 Matriks IFAS

No	STRENGHT-S	Weight	Rating	Score
S1	Production on an industrial scale requires investment, place, and production equipment.	0.04	4	0.17
S2	There is no business incubator for downstream liquid smoke.	0.04	4	0.16
S3	There is no relevant downstream strategy yet.	0.04	4	0.15
S4	Still working alone in downstream and not yet establishing partnerships with MSMEs or household/individual scale fish smokers.	0.04	4	0.15
S5	There is no standard unit production cost due to variations in raw materials, methods, and techniques for producing liquid smoke.	0.04	4	0.16
S6	Depends on the production of smoked fish because of its function as supporting materials.	0.04	4	0.16
S7	Liquid smoke technology does not stand alone but requires oven tools.	0.04	4	0.15
S8	Production on an industrial scale requires investment, location, and production equipment.	0.04	4	0.14
S9	There is no business incubator for downstream liquid smoke.	0.04	3	0.12
S10	There is no relevant downstream strategy yet.	0.04	3	0.13
S11	Still working alone in downstream and not yet establishing partnerships with MSMEs or household/individual scale fish smokers.	0.04	4	0.14
S12	There is no standard unit production cost due to variations in raw materials, methods, and techniques for producing liquid smoke.	0.04	4	0.15
S13	Depends on the production of smoked fish because of its function as a supporting material.	0.04	4	0.14
S14	Liquid smoke technology does not stand alone but requires oven tools.	0.03	4	0.13
S15	Production on an industrial scale requires investment, location, and production equipment.	0.03	4	0.13
S16	There is no business incubator for downstream liquid smoke.	0.03	4	0.14
S17	There is no relevant downstream strategy yet.	0.03	4	0.14
S18	Still working alone in downstream and not yet establishing partnerships with MSMEs or household/individual scale fish smokers.	0.03	4	0.13
S19	There is no standard unit production cost due to variations in raw materials, methods, and techniques for producing liquid smoke.	0.03	4	0.12
S20	Depends on the production of smoked fish because of its function as a supporting material.	0.03	4	0.12
Subtotal				2.82

Table 1 IFAS Matrix (continued)
Tabel 1 Matriks IFAS (lanjutan)

No	WEAKNESS-W	Weight	Rating	Score
W1	Production on an industrial scale requires investment, location, and production equipment.	0.04	2	0.09
W2	There is no business incubator for downstream liquid smoke.	0.04	2	0.08
W3	There is no relevant downstream strategy yet.	0.04	2	0.07
W4	Still working alone in downstream and not yet establishing partnerships with MSMEs or household/individual scale fish smokers.	0.04	2	0.08
W5	There is no standard unit production cost due to variations in raw materials, methods, and techniques for producing liquid smoke.	0.03	2	0.07
W6	Depends on the production of smoked fish because of its function as a supporting material.	0.03	2	0.07
W7	Liquid smoke technology does not stand alone but requires oven tools.	0.03	2	0.07
Subtotal				0.54
Total		1		3.35

Table 2 EFAS Matrix
Tabel 2 Matriks EFAS

No	OPPORTUNITY-O	Weight	Rating	Score
O1	Opportunities for product integration into a new product, namely "liquid smoked fish".	0.04	4	0.16
O2	Building a triple helix partnership of Academics – Business – Government to expedite the downstream process of liquid smoke products.	0.04	3	0.15
O3	Market penetration and positioning to become market commodities (market goods).	0.04	3	0.15
O4	Create and leverage demand for liquid smoke through product integration - demand for liquid smoke follows demand for liquid smoked fish.	0.04	4	0.16
O5	Ensure the stability of demand for liquid smoke through demand for liquid smoked fish.	0.04	4	0.16
O6	Building business collaboration between liquid smoke inventors/producers and fish smoking communities or MSMEs.	0.04	4	0.16
O7	Submit a proposal for assistance with the liquid smoked fish business incubator program through the Chamber of Commerce and Industry (KADIN) with funding from banking, BUMN, or CSR funds.	0.04	4	0.16

Table 2 EFAS Matrix
Tabel 2 Matriks EFAS

No	OPPORTUNITY-O	Weight	Rating	Score
O8	Building business institutions or task forces implementing downstream research products.	0.04	4	0.17
O9	Applying the marketing mix concept and blue ocean strategy in marketing liquid smoke products.	0.04	4	0.16
O10	Develop liquid smoked fish outlets in souvenir centers.	0.04	4	0.16
O11	Implementing a supply chain system in carrying out the commercialization of liquid smoke products.	0.04	4	0.16
O12	Creating joint business capital through cooperatives.	0.04	4	0.16
O13	Value co-creation based on the added value of liquid smoke with the tagline "healthy food free of carcinogens & environmentally friendly".	0.04	4	0.16
O14	Strengthening the competitiveness of smoked fish products in the market, especially in the export market.	0.04	4	0.15
O15	Increase contribution to PSRB and/or GDP through export foreign exchange.	0.04	4	0.15
O16	Building an export market for smoked fish or other smoked-based processed food products, for example smoked meat.	0.04	4	0.15
O17	Designing the concept of royalties or profit sharing based on applicable laws and regulations.	0.04	4	0.15
O18	Marketing and selling liquid smoked fish products through auctions at the State Property & Auction Office or online.	0.04	4	0.14
O19	Overcoming the difficulties of fish smokers regarding the short shelf life of smoked fish (2 days).	0.04	4	0.15
O20	Building a counterpoint to the unpleasant aroma of smoked fish with the narrative "Do you want to be healthy or do you get cancer?".	0.04	4	0.13
Subtotal				3.08
	THREAT-T	Weight	Rating	Score
T1	The power of the consumer/user offering.	0.04	2	0.09
T2	Changes in consumer needs or demands.	0.04	2	0.09
T3	Supply power of suppliers (suppliers).	0.04	2	0.09
T4	Lack of knowledge about consumer/user needs.	0.04	2	0.08
Subtotal				0.35
Total		1		3.43

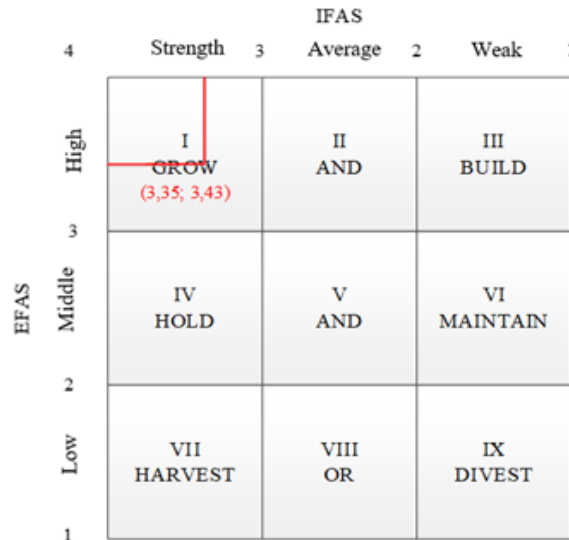


Figure 1 IFAS-EFAS Grand Strategy Matrix
 Gambar 1 Grand Strategy Matrik IFAS-EFAS

Table 3 SWOT Matrix
 Tabel 3 Matrik SWOT

No	STRENGTH-S	STRATEGY (WO)
1	Development of new product innovation for liquid smoked fish.	Producing liquid smoke and liquid smoked fish in one place.
2	Develop triple helix or ABG (academic-business-government) collaboration.	Apply unit cost analysis to the production of liquid smoke and/or liquid smoked fish to determine the cost of production and cost of goods sold.
3	Create demand & market for liquid smoked fish.	Carrying out socio-technical collaboration to develop composite products 'liquid smoked fish'.
4	Develop a 'liquid smoked fish' business incubator.	
5	Submit a proposal to develop a triple helix collaboration, for equipment assistance, and to build a liquid smoke business incubator.	
6	Development of a product downstream task force by the Maritime Affairs & Fisheries Service.	
7	Implement a blue ocean strategy that has no competitors in the liquid smoked fish business based on the marketing mix concept.	
8	Build dan develop outlets selling liquid smoked fish	

Table 3 SWOT Matrix (continued)

Tabel 3 Matrik SWOT (lanjutan)

No	STRENGTH-S	STRATEGY (WO)
9	Make sales via auction at the State Property and Auction Office.	
10	Develop the supply chain and distribution of liquid smoked fish.	
11	Form a cooperative to overcome the lack of capital.	
12	Develop MSMEs in the field of liquid smoked fish processing.	
13	Design a business financing assistance program from banks or non-bank financial institutions.	
14	Design of a royalty system for the use of research results by inventors/innovators of liquid smoke and/or liquid smoked fish together with Maritime Affairs and Fisheries Service.	
15	Promotion, training, and assistance in the application of liquid smoke technology in smoked fish production.	
16	Dissemination, socialization, and promotion of liquid smoked fish consumption by Maritime Affairs and Fisheries Service.	
	STRATEGY (ST)	STRATEGY (WT)
1	Building new trends, tastes, and lifestyles for consuming healthy and carcinogen-free liquid smoked fish by means of dissemination, socialization, and promotion.	Develop production and business capacity and capabilities.
2	Develop attitudes and behavior in consuming liquid smoked fish.	
3	Innovation of the liquid smoked fish business model for MSMEs.	
4	Highlight the benefits and practicality of liquid smoke and/or liquid smoked fish.	
5	Shifting consumer needs and demands from traditional smoked fish to liquid smoked fish.	
6	Assistance to develop demand and market for liquid smoked fish.	

to establish a triple helix or ABG (Academic-Business-Government) partnership, as the second strategy depicted in Figure 2.

An innovation system requires collaboration among academics, businesses, and government. This is evidenced by the requirement for academic research findings to be in accordance with the requirements of the commercial world. In addition, the government must take sides in technological innovation by drafting regulations (Choeriyah & Noviaristanti, 2021). In the context of the triple helix collaboration, academics play the role of inventors of liquid smoke products, business people act as entrepreneurs in the smoked fish industry, and the government is responsible for formulating policies related to product marketing. Specifically, this responsibility falls on the Fisheries and Maritime Department and the Department of Industry, Trade, and Micro, Small, and Medium Enterprises (MSMEs) as the third strategy.

The fourth strategy is to create demand and a market for liquid smoked fish products. This is related to the fifth strategy, namely developing a liquid smoked fish business incubator, thereby creating a market for fish products using liquid smoke. In order to execute the fourth and fifth strategies, it is imperative to establish a collaborative partnership between academic, industry, and government, known as a triple helix collaboration. Additionally, preparing and

submitting a plan to secure funding for acquiring the necessary equipment to establish a liquid smoke business incubator is essential. Business incubators have been proven effective in creating jobs and accelerating the growth of new businesses (Darmawan, 2019).

The sixth strategy is establishing a specialized team, a downstream product task force, under the Maritime Affairs and Fisheries Service. This involves implementing the blue ocean strategy in the liquid smoked fish industry, where there are no competitors. This approach is based on the marketing mix concept and is considered the seventh strategy. Next, implement the eighth strategy: establishing and expanding retail locations specializing in selling liquid smoked fish. The ninth strategy involves conducting sales through auctions at the State Property and Auction Office. This approach is a successful and efficient marketing tactic that may be implemented at the government stakeholder level. The tenth strategy involves collaborating with traditional fish smokers and fish suppliers from Fish Auction Places to expand the supply chain and deliver liquid smoked fish.

Forming a cooperative to overcome the lack of capital as the eleventh strategy is the hope of fish smoking entrepreneurs to continue to produce and produce liquid smoked fish products. Furthermore, it is developing MSMEs in liquid smoked fish processing in collaboration with the MSME Service. This can increase both entrepreneurs' and regional

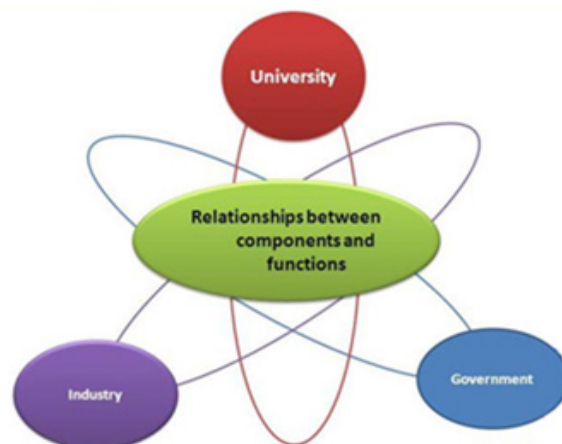


Figure 2 Triple helix collaboration (Science Nigeria, 2022)

Gambar 2 Kolaborasi Triple Helix (Science Nigeria, 2022)

income. MSMEs are crucial in distributing community income and increasing people's purchasing power. Developing MSMEs is also very strategic in driving the national economy (Fadilah *et al.*, 2021). This is the twelfth strategic step.

The thirteenth strategy: design a business financing assistance program from banks and non-bank financial institutions. This program aims to provide capital assistance for the marketing and selling of liquid smoked fish products. Developing a royalty system for utilizing research findings by inventors of liquid smoke and liquid smoked fish, in collaboration with the Marine Fisheries Service, to ensure the sustainability of the downstream process. This system will be implemented as the fourteenth strategy and will serve as the pinnacle of the downstream strategy. It will involve conducting promotions, training, and assisting in applying liquid smoke technology to produce smoked fish. Additionally, the inventors and the Maritime Fisheries Service will make efforts to disseminate, socialize, and promote the consumption of liquid smoked fish.

Successful downstream requires collaboration and a shared vision and objective among all parties engaged in achieving the goals. Therefore, the government, inventors, and entrepreneurs need to be able to move together. In order for inventors to continue advancing their products, entrepreneurs must be willing to adopt and utilize these products. Additionally, the government plays a crucial role as a key actor and intermediary, having the authority to establish policies related to product distribution and facilitate training activities to transfer knowledge about downstream product development. Promotion is a communication system in marketing. Promotion is categorized as advertising, personal selling, promotional sales, and public relations, based on the type of tool used. Promotions are designed to increase sales and profits (Alexandrescu & Milandru, 2018). Good promotion is persuasive, informative advertising that reminds one of the marketed product (Justina *et al.*, 2023).

CONCLUSION

Based on the results of the SWOT analysis, it can be concluded that the obstacle faced in implementing the previous strategy was the lack of collaboration in marketing liquid smoke products. So there is a need for a plan for downstream liquid smoke products by creating liquid smoked fish products and establishing strategic partnerships between academics, business actors, and the government. The triple helix partnership is important to develop a sustainable blue economy by using fishery products as a source of income.

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