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Supply Chain Mapping of Pempek Products Through a Green Economy Approach

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Abstrak

Indonesia merupakan salah satu negara paling multikultural di dunia, di mana setiap daerah memiliki karakteristik dan keunikan tersendiri, mulai dari bahasa daerah, pakaian adat, tarian, musik, upacara adat, kerajinan tangan, hingga makanan tradisional. Salah satu wilayah tersebut adalah Sumatera Selatan, khususnya Kota Palembang, yang terkenal dengan makanan tradisional ikoniknya, yaitu pempek. Pempek tidak hanya merepresentasikan budaya Palembang, tetapi juga berperan sebagai kontributor vital bagi perekonomian lokal. Seiring dengan terus meningkatnya permintaan terhadap pempek, baik dari dalam maupun luar daerah, produksinya telah tumbuh secara signifikan, yang mendorong perkembangan pesat Usaha Kecil dan Menengah (UKM) untuk memenuhi kebutuhan pasar. Namun, proses produksi pempek, mulai dari pemasok hingga ke tangan konsumen, dapat menimbulkan dampak negatif terhadap lingkungan, seperti penggunaan bahan baku yang tidak berkelanjutan, konsumsi energi yang tinggi, dan pengelolaan limbah yang belum optimal. Oleh karena itu, perlu dilakukan penelitian mengenai produksi dan distribusi pempek yang berkelanjutan guna meminimalkan kerusakan lingkungan. Dalam konteks ini, penerapan pendekatan ekonomi hijau (green economy) menjadi sangat relevan. Ekonomi hijau menekankan pada efisiensi sumber daya, pengurangan limbah, dan peningkatan kualitas lingkungan. Tanpa penerapan prinsip-prinsip ekonomi hijau, industri pempek berpotensi menyebabkan degradasi lingkungan yang dapat mengancam ketersediaan sumber daya alam yang esensial untuk memproduksi pempek. Penelitian ini bertujuan untuk memetakan rantai pasok produk pempek saat ini dari hulu ke hilir, serta mengidentifikasi faktor internal dan eksternal dalam penerapan pendekatan ekonomi hijau pada rantai pasok produk pempek tersebut.

***Kata Kunci**: Ekonomi Hijau; Metode SWOT; Manajemen Rantai Pasok; Usaha Mikro, Kecil, dan Menengah (UMKM)*

Abstract

Indonesia is one of the most multicultural countries in the world, where each region has its own distinct characteristics and uniqueness, ranging from local languages, traditional clothing, dances, music, traditional ceremonies, handicrafts, and traditional foods. One of these diverse regions is South Sumatra, particularly the city of Palembang, which is famous for its iconic traditional food, pempek. Pempek not only represents the culture of Palembang but also serves as a vital contributor to the local economy. As demand for pempek continues to rise, both locally and from other regions, its production has grown significantly, leading to the rapid development of small and medium-sized enterprises (SMEs) to meet market needs. However, the production process of pempek, from suppliers to consumers, can have negative environmental impacts, such as the use of unsustainable raw materials, high energy consumption, and suboptimal waste management. Therefore, it is necessary to conduct research on sustainable production and distribution of pempek to minimize environmental damage. In this context, the application of a green economy approach is highly relevant. The green economy emphasizes resource efficiency, waste reduction, and environmental quality improvement. Without implementing green economy principles, the pempek industry has the potential to cause environmental degradation, threatening the natural resources that are essential for pempek production. The purpose of this study is to map the current supply chain of pempek products from upstream to downstream and to identify internal and external factors in implementing a green economy approach within the pempek product supply chain.

***Keywords**: Green Economy, MSMEs; Supply Chain Management; SWOT Method*

1. Introduction

Pempek is a traditional food from South Sumatra, particularly the city of Palembang, which has become widely known across various cities in Indonesia. Pempek not only holds cultural value but also serves as a significant economic commodity in the Palembang region. The economic activities of a considerable portion of the community heavily depend on pempek sales, ranging from small traders to MSMEs (Rodiah & Yunita, 2022; Suroso et al., 2023; Syarifuddin et al., 2022). According to the Palembang City Cooperative and MSME Office, there were 2,887 MSMEs operating in the production and sales of pempek in 2023-2024. The production and distribution of pempek in practice involve

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many actors within the supply chain, starting from raw material suppliers such as ground fish traders and spice vendors to producers, distributors, and retailers (Agung Pramana et al., 2022; Maria et al., 2022). However, with the rapid economic development and increasing public awareness of environmental issues, mapping the pempek product supply chain with a green economy approach has become an urgent need that requires more specific analysis.

The green economy is an idea that integrates economic aspects with environmental sustainability. In practice, rapid economic growth should not harm the surrounding environment but instead encourage the sustainable use of resources (Khoirunisa Wahida & Hoirul Uyun, 2023). Research on pempek production in Palembang has so far predominantly focused on economic aspects, particularly in determining production cost pricing and optimizing profits. The primary focus of these studies has been on how business actors can reduce production costs and maximize profits (Saputri et al., 2022; Usman et al., 2023; Zein et al., 2021), leaving other essential aspects of the production process, such as environmental sustainability, underexplored.

For example, strategies to reduce environmental impacts through a green economy approach, such as waste reduction and the use of environmentally friendly raw materials, have not received sufficient attention. In fact, applying green economy principles could provide additional benefits, both in terms of environmental sustainability and enhancing product competitiveness in an increasingly sustainability-conscious market. The integration of the green economy into pempek research and production is expected to foster innovations that are economically and ecologically advantageous.

Therefore, more comprehensive research, encompassing economic, environmental, and social aspects, is crucial to improving the overall quality of pempek production and supporting sustainable development in Palembang. If these challenges are not addressed promptly, the sustainability of the pempek industry could be at risk. To tackle this issue, it is necessary to map the current product supply chain and identify internal and external factors related to the implementation of the green economy within the pempek supply chain.

Several studies related to supply chain mapping have been conducted previously, covering supply chains of clothing, food, and non-food products (Dewi et al., 2020; Janna et al., 2024; Rizkina & Nalawati, 2022; Sampepajung & Sumardi, 2022). Food supply chain analysis is generally limited to raw material products, such as chilies and cabbages, and mainly highlights supply chain mechanisms, including product, information, and financial flows (Angelia et al., 2021; Kambey et al., 2016; Tubagus et al., 2016). However, the mapping of traditional food product supply chains, particularly pempek, remains limited. Moreover, the perspective related to the green economy in a supply chain is still scarce, as the concept of the green economy is mostly applied to general industries (Anisa Rosyidasari & Iftadi, 2020; Annisa & Harahap, 2023; Bukran & Ramdani, 2024; Fuad, 2021; Yanti et al., 2024).

Therefore, this study will focus on the supply chain of pempek products, which are a culinary icon of Palembang, by providing a new perspective on the implementation of the green economy in small to medium-scale food industries that have local cultural value. With a comprehensive approach, this study integrates supply chain analysis and identifies internal and external factors in the implementation of the green economy within it. The results of this study are expected to serve as a basis for developing a green economy model that can be implemented in the traditional food industry sector, particularly pempek, and be used as a reference for other traditional food industry sectors.

2. Research Methods

This research was conducted over a period of three months, from January 2025 to March 2025. The research locations included various traditional and modern markets as well as several MSMEs involved in the production and distribution of pempek in Palembang City. The study began with setting objectives and planning to map the pempek product supply chain and identify challenges and opportunities in implementing the green economy. The initial stage involved a literature study to understand the concepts of supply chain, green economy, and the pempek industry. References were drawn from relevant journals, books, and scientific articles.

Subsequently, a survey was conducted among supply chain actors, ranging from raw material suppliers to end consumers. Data were collected through interviews and questionnaires to understand the production processes, distribution, resource utilization, and waste management. Afterward, data analysis was performed to identify issues such as inefficient resource use or poor waste management.

The next stage involved supply chain mapping in the form of diagrams to illustrate the flow of raw materials, energy, and waste. SWOT analysis was then used to assess internal and external factors affecting the implementation of the green economy. Based on this analysis, priority strategies were determined (Nursalam & Yunanda, 2023).

The research concluded with findings and recommendations aimed at enhancing the sustainability of the pempek supply chain. Recommendations were formulated based on discussions with industry stakeholders, with the goal of creating a more environmentally friendly and efficient system.

3. Results and Discussion

3.1. Supply Chain Mapping

The pempek supply chain consists of suppliers, producers, and distributors. The main raw materials, such as flour, minced fish, eggs, and salt, are sourced from grocery traders and minced fish sellers scattered across various markets in Palembang. These raw materials are then processed by pempek MSMEs through mixing, dough shaping, boiling, and frying. After production, pempek is distributed by mobile vendors before reaching consumers. However, some MSMEs also sell their products directly to consumers without intermediaries. This supply chain ensures that pempek can be produced and distributed effectively to customers. An illustration of the pempek product supply chain can be seen in the image below.

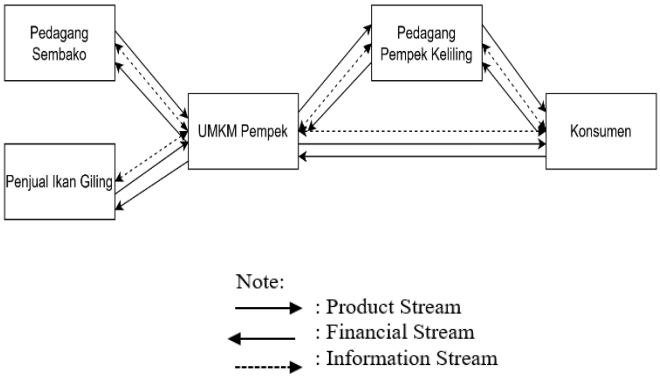

Figure 1: The Supply Chain of Pempek

In a supply chain, the flow of products moves from suppliers to consumers. In the pempek supply chain, this flow begins with staple goods traders and minced fish sellers as suppliers and then continues to pempek MSMEs as producers. Once produced, pempek can be sold directly to consumers or first distributed through mobile pempek vendors before finally reaching the buyers. Meanwhile, the financial flow in the pempek supply chain moves in the opposite direction of the product flow. Consumers pay mobile pempek vendors when purchasing pempek. The vendors then pay the pempek MSMEs as the producers. The MSMEs use this income to purchase raw materials from suppliers, such as staple goods traders and minced fish sellers. Thus, the financial flow starts from consumers, continues to mobile pempek vendors, then to pempek MSMEs, and finally reaches the suppliers as raw material providers.

Furthermore, the flow of information in the pempek supply chain moves in both directions, from the beginning to the end and vice versa. Information about market demand, consumer preferences, and prices is conveyed from consumers to mobile pempek vendors, and then to pempek MSMEs. The MSMEs use this information to adjust production, both in terms of quantity and types of pempek. Subsequently, raw material needs are communicated to suppliers, such as staple goods traders and minced fish sellers, to ensure continuous supply. Conversely, information about the availability and prices of raw materials flows from suppliers to pempek MSMEs to maintain smooth production.

3.2. SWOT Analysis

The SWOT analysis begins with the formulation of indicators that represent internal and external factors. These indicators are obtained through direct field observations, interviews with respondents, and a literature review from several sources (Anggreni Br Tarigan & Perwira Ompusungu, 2023; Liani & Jumaidi, 2023; Srikalimah et al., 2021; Thuyen, 2023). Subsequently, these indicators are structured into a questionnaire, which is then distributed to respondents. The completed questionnaires are used as the basis for determining weights and ratings in the SWOT analysis. The results of the calculations can be seen in the table below.

Table 1: The Result of SWOT Analysis

No	Internal Factors	Weight	Rating	Score
Strengths				
1	Affordable product prices	0.1367	4	0.5468
2	Affordable raw material prices	0.1259	4	0.5036
3	Low production costs	0.1295	4	0.5180
4	The product is a type of local culinary wisdom favored by all groups	0.1295	4	0.5180
5	Strategic business location	0.1331	4	0.5324
Weakness				
1	The production process is still carried out manually.	0.0755	2	0.1511
2	Lack of technology or facilities in waste processing.	0.0755	2	0.1511
3	Has not yet utilized environmentally friendly raw materials.	0.0755	2	0.1511
4	Limited training or knowledge about eco-friendly practices.	0.0432	1	0.0432
5	Dependence on supporting raw materials that produce waste that is difficult to replace.	0.0755	2	0.1511
	Total	1		3.2662
Opportunities				
1	There is a market opportunity to produce eco-friendly pempek.	0.0922	3	0.2766

No	Internal Factors	Weight	Rating	Score
2	There is potential in processing pempek production waste into value-added products.	0.0567	2	0.1135
3	Government support for eco-friendly programs (regulations, subsidies, training).	0.1312	4	0.5248
4	Collaboration between private sector parties in the pempek production supply chain and the government in creating pempek products.	0.0957	3	0.2872
5	There is consumer interest in products that support the green economy concept.	0.1135	3	0.3404
Threats				
1	Consumers do not prioritize choosing eco-friendly pempek products	0.1099	3	0.3298
2	Many competitors in pempek product sales	0.0603	2	0.1206
3	Challenges in obtaining sustainable raw materials	0.1135	3	0.3404
4	Public complaints related to the environmental impact of the business	0.0887	2	0.1773
5	Increasingly strict environmental regulations for MSMEs	0.1383	4	0.5532
	Total	1		3.0638

Based on the SWOT analysis, the research results indicate that the pempek industry is positioned in Quadrant I (Growth-Oriented Strategy), which leads to the application of an aggressive strategy. This strategy aims to leverage existing strengths to capitalize on available opportunities. The recommended strategies based on the SWOT analysis are as follows:

1. Utilizing Strengths to Maximize Opportunities
   To enhance competitiveness, the pempek industry needs to optimize production efficiency to maintain competitive prices and establish strategic partnerships with suppliers to ensure raw material stability. Additionally, developing products that align with market trends, such as healthy or premium variants, as well as innovating in product differentiation, can increase consumer appeal. In terms of marketing, leveraging both digital and offline strategies is crucial to expanding market reach, including forming partnerships with modern retail outlets and e-commerce platforms.
2. Strengthening Internal Capacity
   Enhancing human resources and operational management can be achieved through employee training to improve skills in production and service, as well as optimizing the supply chain for greater efficiency. Additionally, adopting digital technology is a strategic move, including utilizing social media and e-commerce for marketing and developing an online ordering system to facilitate customer access.
3. Risk Mitigation and Trend Adaptation
   To maintain stable raw material prices, long-term cooperation with suppliers and the use of alternative ingredients that maintain product quality are necessary. Furthermore, compliance with regulations, such as food safety standards and halal certification, is essential to expand market reach. Adapting products to healthier and more sustainable consumption trends can also enhance competitiveness and attract more customers.

4. Conclusion

Based on this research, it can be concluded that the supply chain mapping of pempek products in Palembang City shows that the supply chain consists of suppliers (grocery traders and ground fish sellers), producers (pempek SMEs), and distributors (mobile pempek vendors). The product flow moves from suppliers to producers and then to consumers, while the financial flow moves from consumers back to suppliers. The information flow occurs in both directions, influencing raw material availability and production strategies.

The pempek industry still faces challenges in implementing a green economy, such as manual production processes, a lack of waste management facilities, and the use of non-environmentally friendly raw materials. In addition, understanding and training on sustainable practices remain limited. However, there are opportunities to be leveraged, such as the growing market interest in environmentally friendly products, government support through regulations and incentives, as well as waste processing that can generate added value and support the sustainability of the pempek industry.

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