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Current Advanced Research on Sharia Finance and Economic Worldwide
https://ojs.transpublika.com/index.php/CASHFLOW
Online ISSN 2809-8226 | Print ISSN 2809-848X

https://doi.org/10.55047/cashflow.v4i1.1591

Original Article

Risk Analysis of the Cooking Oil Industry in the Maloy Batuta Trans Kalimantan Special Economic Zone

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Received : 02 September - 2024
Accepted : 20 October - 2024
Published online : 28 October - 2024

Abstract

Management risk in cooking oil industry is important. This paper to analyze various risks faced by the palm oil-based cooking oil industry in the Maloy Batuta Trans Kalimantan Special Economic Zone (KEK MBTK), Kutai Timur, East Kalimantan, and to formulate mitigation strategies to support the sustainability of the area. The risks examined include fluctuations in Crude Palm Oil (CPO) prices, infrastructure limitations, environmental pressures, regulatory uncertainties, and social conflicts. The research employs a qualitative descriptive approach, collecting data through interviews, literature reviews, and document analysis. The findings indicate that infrastructure improvements, the adoption of environmentally friendly technologies, product diversification, and community involvement are key strategies for addressing these risks. The study concludes that an integrated risk management approach is crucial to enhancing the competitiveness of the cooking oil industry in KEK MBTK while fostering sustainable economic growth in Kutai Timur.

Keywords: Risk Management, Cooking Oil Industry, Maloy Batuta Trans Kalimantan

1. Introduction

According to BPS data, throughout 2021 vegetable cooking oil imports were recorded at 56.43 million kilograms. This realization increased by 3.04% compared to imports during 2020. The largest cooking oil exporting countries consisting of: Malaysia, Thailand, Australia, Spain and Italy, are international/global competitors that must be faced by domestic cooking oil producers. Meanwhile, in January 2022, imports of vegetable cooking oil were recorded at 4.42 million kg. This number increased by 4.37% compared to January 2021 of 4.23 million kg (Badan Pusat Statistik Provinsi Kalimantan Timur, 2023).

Based on statistical data on plantations in East Kalimantan Province, in 2023 the Oil Palm plantation in East Kutai Regency had the highest area of other districts / cities with an area reaching 452,556 hectares or 33.98% of the total area of oil palm plantations in East Kalimantan Province. In addition, the production rate of oil palm plantations in East Kutai Regency also has the highest production rate compared to other districts/cities in East Kalimantan Province, reaching 7,876,111 tons or 38.03% of the total oil palm production in East Kalimantan Province (Badan Pusat Statistik Kabupaten Kutai Timur, 2023).

East Kutai, East Kalimantan, was chosen as the location of the Maloy Batuta Trans Kalimantan (MBTK) Special Economic Zone (SEZ) because of its strategic position as the center of downstream palm oil in Indonesia. The region has abundant natural resource potential, especially Crude Palm Oil (CPO) as the main raw material for the cooking oil industry. The availability of large quantities of raw materials around the region provides a

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significant comparative advantage (Setiawan, 2018), while supporting operational efficiency through reduced logistics costs. In addition, East Kutai also has direct access to international trade routes through the Makassar Strait, which enables faster and more efficient distribution of products to global markets.

In addition, the selection of East Kutai as the location of KEK MBTK is in line with the government's efforts to encourage equitable development outside Java (Adnan, 2018). This area is prioritized as part of the national strategy to strengthen the downstream palm oil sector and encourage local economic growth. The development of SEZs in East Kutai not only has a positive impact on the regional economy but also creates employment opportunities for local communities. With proper training and empowerment, the management of these SEZs can increase the involvement of local communities in the industry, thereby reducing economic inequality in the region (Setianingsih & Panjawa, 2022).

The palm oil-based cooking oil industry is a strategic sector that contributes significantly to the Indonesian economy (Mulyadi et al., 2019), particularly through exports and employment generation. However, the sector faces various complex challenges (Sulaiman, 2019), especially in the Maloy Batuta Trans Kalimantan (MBTK) Special Economic Zone (SEZ). KEK MBTK is designed as a palm oil downstream center with the hope of increasing the added value of cooking oil products and other derivatives (Firdaus, 2020). However, the success of this area is inseparable from various risks that affect the sustainability and competitiveness of the industry.

In terms of infrastructure, KEK MBTK faces significant limitations, such as unoptimized access roads, ports with limited facilities, as well as the need for supporting facilities such as wastewater treatment plants (WWTP) and a stable electricity supply. These limitations not only hamper logistics efficiency but also affect the region's attractiveness to investors. Therefore, improving infrastructure is a priority to ensure the smooth operation of industries in the region (Yulia, 2021; Yusoff, 2020).

One of the main challenges faced in the cooking oil industry is market risk, especially fluctuations in the price of Crude Palm Oil (CPO) as the main raw material (Ali & Zulkarnain, 2019; Nurhadi, 2019). In addition, changing global consumer preferences towards alternative vegetable oils, such as soybean oil and sunflower oil, are pressuring palm oil's market share (Hasan et al., 2020). Environmental and health campaigns highlighting the impact of deforestation and high saturated fat content have also further affected the competitiveness of palm-based cooking oil products in the international market. Therefore, product diversification strategies and the implementation of sustainability standards are needed to overcome these challenges (Putri, 2018; Rahman, 2021; Wildain, 2022).

In addition, environmental risks are also a major concern in the development of this area. Waste from cooking oil production, whether in the form of liquid waste, solid waste, or gas emissions, has great potential to pollute the environment if not managed properly (Yusoff, 2020). The clean water crisis that often occurs around industrial estates is also an additional challenge that needs to be addressed through the application of environmentally friendly water recycling and waste treatment technologies (Cahya & Atiyatul Maula, 2021). This step is important to ensure the sustainability of industrial operations while protecting local ecosystems (Yulia, 2021).

Social risks, such as potential conflicts with local communities, also require serious attention (Sukardi et al., 2020; Wijaya, 2019). Inequality in the distribution of economic benefits, lack of community involvement in planning, and lack of employment opportunities for local labor can trigger social resistance. Therefore, regional managers need to develop community empowerment programs, including job training and partnerships with local

MSMEs, to ensure that the benefits of regional development are felt equally. This study aims to identify and analyze these risks and formulate effective mitigation strategies to support the sustainability of the cooking oil industry in KEK MBTK.

2. Literature Review

Risk management is a systematic process for identifying, analyzing, and managing risks that may affect the achievement of organizational or project objectives. Risk management involves identifying risks, analyzing impacts and probabilities, evaluating risks, and implementing mitigation measures to reduce potential losses. In an industrial context, risk management helps organizations prepare for uncertainties that can hinder operations, such as regulatory changes, logistical disruptions, or fluctuations in raw material prices (Widodo & Santoso, 2020).

In the palm oil-based cooking oil industry, risk management is particularly important because the sector is faced with a variety of complex risks, including market, infrastructure, environmental, social, and operational risks. According to research by (Rosnani et al., 2021), the implementation of good risk management strategies can improve the competitiveness and sustainability of the industry. For example, product diversification and the application of environmentally friendly technologies are effective mitigation measures to deal with changing consumer preferences and sustainability campaign pressures. In addition, risk management enables companies to identify new opportunities, such as market expansion into developing countries with high demand for cooking oil.

In regional development such as the Maloy Batuta Trans Kalimantan (MBTK) Special Economic Zone (SEZ), risk management also serves to ensure project sustainability. According to Widodo & Santoso (2020), an integrated approach to risk management can reduce the negative impact of infrastructure risks, such as limited transportation access or suboptimal supporting facilities. This involves collaboration between the government, SEZ managers, and the private sector to ensure careful planning, efficient resource allocation, and engagement with local communities (Kartika et al., 2018). With the implementation of comprehensive risk management, KEK MBTK has a greater chance of achieving economic, social, and environmental development goals in a sustainable manner (Anwar, 2017).

3. Methods

This research uses descriptive qualitative methods to understand the risks and mitigation strategies in the cooking oil industry in KEK MBTK. The data used is primary data by conducting interviews with KEK MBTK managers, cooking oil industry companies, local communities, and local governments. In addition to primary data, secondary data were also used by studying literature, regulatory documents, industry reports, and scientific articles on the risks of the cooking oil industry. The sample consisted of key informants consisting of KEK MBTK managers, local MSME leaders, local government officials, and environmental experts. In addition, this study also used additional respondents, namely the community around KEK MBTK who were directly affected by the development of the area.

Data analysis was conducted by conducting content analysis by reviewing regulatory documents, industry reports, and interviews to identify key themes related to risk and mitigation. It also triangulates data by using various data sources to ensure the validity and reliability of the findings.

The steps in the research are first, identifying risks based on literature and interviews, then analyzing the relationship between risk factors (infrastructure, environment, social) with industrial sustainability. Second, formulating risk mitigation recommendations based on the results of the analysis. Validation techniques were carried out by validating the findings by conducting focus group discussions (FGDs) with stakeholders to evaluate the results of the analysis. In addition to FGDs, industry comparative studies and Peer Review involving experts from relevant fields were also conducted to ensure the quality of the research results.

4. Results and Discussion

The cooking oil industry, especially palm oil-based, is a strategic sector with great potential but is not free from various complex risks. These risks include market challenges due to fluctuations in Crude Palm Oil (CPO) prices, competition with alternative vegetable oils, and pressure from environmental campaigns and changing global consumer preferences. In addition, infrastructure constraints, potential social conflicts, and changing regulations may hinder the efficiency and competitiveness of the industry. Therefore, understanding and managing these risks in an integrated manner is crucial to ensure the sustainability and profitability of the cooking oil industry, especially in strategic areas such as the Maloy Batuta Trans Kalimantan SEZ.

4.1. Market Risk

The price of Crude Palm Oil (CPO), the main raw material for the cooking oil industry, is highly volatile in the global market. These price changes can affect production costs and profit margins. In recent years, changing market needs have shown increasing demand for alternative vegetable oil products, such as soybean oil, sunflower oil and canola oil. These products are often viewed as healthier by certain consumers, especially in developed countries. This factor is influenced by health campaigns that emphasize oils with lower saturated fat content compared to palm oil. As a result, consumer preferences for non-palm oil vegetable oils can pressure the market share of palm oil-based cooking oils, especially in the premium market segment or the more health-conscious public.

Apart from health factors, sustainability issues are also a reason for the increasing demand for alternative vegetable oils. Environmental campaigns highlighting the deforestation impact of palm oil plantations are influencing market perception, especially in regions such as Europe and North America. Consumers in these markets are increasingly prioritizing products that have sustainability certifications or come from raw materials that are considered more environmentally friendly. If the palm oil industry does not respond with appropriate strategies, the risk of declining competitiveness in the global market will increase.

However, these changing needs also provide opportunities for the palm oil industry to innovate. By diversifying products and implementing stricter sustainability standards, palm oil can still compete in the global market. Building awareness about palm oil's productivity advantages over other vegetable oils, such as higher yields per hectare, can be a strategy to overcome this challenge. By promoting sustainable palm oil through certifications such as RSPO (Roundtable on Sustainable Palm Oil), the industry can regain consumer confidence and maintain its position in the changing market.

Indonesia faces stiff global competition from palm oil producing countries such as Malaysia and Thailand, which have built strong processing infrastructure and offer attractive incentives to investors. These two countries not only have more advanced technology, but also efficient logistics systems to support the export of their derivative products. The fiscal incentives and ease of licensing offered by Malaysia and Thailand are an additional attraction

for businesses, which could put Indonesia at a competitive disadvantage if it does not immediately improve its facilities and supporting policies. To maintain its advantage, Indonesia needs to accelerate infrastructure development in strategic areas such as the Maloy Batuta Trans Kalimantan SEZ, while strengthening the incentive system that can attract more investors to the downstream palm oil sector.

4.2. Infrastructure Risk

Transportation accessibility is an important element in supporting the operations of the Maloy Batuta Trans Kalimantan (MBTK) Special Economic Zone (SEZ). Currently, the road conditions leading to KEK MBTK still require quality improvement to ensure smooth logistics mobility. Sub-optimal road infrastructure, such as damage to the road surface or inadequate capacity, can hamper the transportation of raw materials and distribution of finished products. Heavy vehicles such as trucks transporting Crude Palm Oil (CPO) and cooking oil require transportation routes that are strong and resistant to heavy loads to efficiently support industrial activities.

Improved road accessibility will also have a significant economic impact on the surrounding area. Better roads not only speed up logistics distribution, but also improve inter-regional connectivity, which in turn supports local economic growth (Haryanto et al, 2019). Local governments and SEZ managers need to make road infrastructure improvements a priority, both through local budget allocations and partnerships with the private sector. With adequate road infrastructure, KEK MBTK can be more attractive to investors and ensure the sustainability of its industrial operations.

An inadequate port is one of the main challenges for the operation of the Maloy Batuta Trans Kalimantan (MBTK) Special Economic Zone (SEZ). Currently, KEK MBTK is only equipped with a limited berthing jetty, which is not sufficient to handle large-scale export activities. The absence of a modern port with complete facilities can slow down the distribution of finished products, such as cooking oil, to international markets. In addition, this condition has the potential to increase logistics costs as it forces the use of port facilities in other, more distant locations, reducing the region's efficiency and competitiveness at the global level.

Not only the port, the limited supporting facilities are also a significant obstacle to the operation of KEK MBTK. Infrastructure such as an adequate Waste Water Treatment Plant (WWTP) is urgently needed to support environmentally friendly production processes and comply with AMDAL standards. Currently, the absence of an optimally functioning WWTP in the area can increase the risk of environmental pollution and impact the image of the cooking oil industry as a sustainable product. In addition, the need for a large-capacity electricity network has also not been fully met, which could hamper the smooth running of large-scale production processes.

To overcome these limitations, strategic steps need to be taken immediately, including accelerating the construction of modern export ports and the development of supporting facilities such as WWTP and electricity networks. Collaboration between the government, SEZ managers, and the private sector is needed to fund and realize these infrastructure projects. With an adequate port and supporting facilities, KEK MBTK can optimize export potential, attract more investment, and ensure the sustainability of the cooking oil industry operations in the region.

4.3. Environment Risk

The cooking oil industry faces major risks in terms of pollution and waste management. The cooking oil production process can generate waste in the form of air pollution from greenhouse gas emissions, liquid waste that has the potential to pollute water sources, and

solid waste such as palm dregs. If not managed properly, these wastes can have a negative impact on the surrounding environment, including a decrease in air and water quality that has a direct impact on public health. Therefore, the implementation of modern waste treatment technology that complies with environmental standards is a must to mitigate this risk.

In addition to pollution, the risk of deforestation is also a serious concern in developing new land to support the cooking oil industry. Land clearing for oil palm plantations or construction of industrial facilities often triggers damage to local ecosystems, including loss of wildlife habitat. This impact can be exacerbated if the spatial planning process does not consider the balance between the needs of industry and environmental preservation. Therefore, sustainable approaches such as reforestation and protection of protected forest areas should be an integral part of the sector's development strategy.

The clean water crisis is also a major challenge, given that the cooking oil production process requires large amounts of water. The high demand for water for the production process can reduce the availability of clean water for surrounding communities, especially in areas that are already stressed for water resources. To address this, the industry needs to adopt water recycling technologies and prioritize water use efficiency in its operations. These measures not only help protect water resources, but also create an image of an environmentally responsible industry.

4.4. Licensing and Regulatory Risk

A complex licensing process is one of the main obstacles to the development of the cooking oil industry in the Maloy Batuta Trans Kalimantan (MBTK) SEZ. Important permits such as the Environmental Impact Assessment (AMDAL) and location permit are often delayed due to lengthy administrative procedures and lack of integration. This can delay the start of industrial operations and increase project development costs. To address these issues, reforming the licensing system by utilizing digital technology such as OSS (Online Single Submission) is needed to speed up and simplify the administrative process.

In addition, fiscal policy changes also pose significant challenges to the industry. Policies such as inconsistent export levy rates, sales taxes or fiscal incentives can affect the industry's competitiveness in the global market. For example, an increase in export tariffs can increase production costs and reduce profit margins, making Indonesian products less competitive with other producing countries. Therefore, the government needs to ensure stable fiscal policies that support investment, especially for strategic sectors such as palm oil downstreaming.

Legal uncertainty, including land disputes or agrarian conflicts with local communities, is also a risk that can hamper industry operations. These issues often arise due to overlapping land ownership or lack of transparency in the land acquisition process. Mitigating this risk requires accurate spatial mapping, community involvement in planning, and effective mediation efforts in case of conflict. With this approach, industries can operate without legal interference and at the same time build harmonious relationships with surrounding communities.

4.5. Social Risk

The development of industrial estates, such as the Maloy Batuta Trans Kalimantan (MBTK) SEZ, has the potential to trigger conflicts with local communities if the economic benefits are not shared equally. These conflicts can arise in the form of resistance or social protests, especially if the development of the area sacrifices community land without adequate compensation. In addition, social jealousy can arise when local communities feel excluded from decision-making processes related to projects that have a direct impact on their lives. To

prevent this, a participatory approach should be taken by involving local communities in the planning and implementation stages, as well as providing transparency regarding the economic benefits they will receive.

One of the main factors that can exacerbate social tensions is the local labor gap (Sari et al, 2018). When industries hire more workers from outside the region, local communities often feel neglected even though they live in the vicinity of the industrial estate. This can create dissatisfaction and increase the distance between the industry and local communities. To address this issue, SEZ managers should invest in the training and skills development of local communities so that they are prepared to compete for available job positions in the region.

In addition to providing employment opportunities, it is important for industries to develop broader community empowerment programs. For example, supporting local small and medium enterprises (MSMEs) by involving them in the supply chain or providing access to capital. Programs like these not only help reduce economic disparities, but also strengthen the relationship between the industry and local communities. With these measures, industrial estate development can run smoothly while creating positive socio-economic impacts for all parties.

4.6. Operational Risk

The availability of raw materials in the form of Crude Palm Oil (CPO) around KEK Maloy Batuta Trans Kalimantan (MBTK) is abundant, but its quality is a challenge that must be considered. CPO that does not meet quality standards can cause disruptions to the production process, such as machine breakdowns or final products that do not meet market specifications. This issue can be addressed by improving the quality control system in CPO mills, including consistent implementation of quality standard certification. In addition, long-term cooperation with trusted raw material suppliers needs to be established to ensure stability of quality supply.

Stable energy supply is also a crucial factor in supporting the smooth operation of the cooking oil industry. Disruptions in the power grid or insufficient energy capacity can hamper the production process, especially on a large scale. To overcome this, industries in KEK MBTK need to utilize alternative energy sources such as biomass from palm oil waste or build independent power plants. This step not only ensures a stable energy supply, but also improves operational sustainability through the utilization of renewable energy.

Reliance on advanced technology is also a challenge, especially in the event of technical glitches or a lack of experts capable of managing the technology. Production efficiency is highly dependent on the technology's ability to optimize processes, making it important for the industry to invest in regular maintenance and technology updates. In addition, training the local workforce to operate and maintain these technologies should be a priority. By doing so, the industry can minimize operational risks due to technology dependency and ensure continuous smooth production.

Risk mitigation is an important step in ensuring the sustainability and operational success of the cooking oil industry, especially amidst complex challenges. As a strategic sector that faces market, environmental, social and technical risks, careful risk analysis is the foundation for identifying potential obstacles while formulating effective solutions. With proper mitigation, the cooking oil industry can not only reduce the negative impact of existing risks but also improve its efficiency, competitiveness, and contribution to national economic growth.

4.6.1. Market Risk Mitigation

a) Product diversification by developing derivative products other than cooking oil, such as margarine, shortening, and oleochemical-based products to expand market share and reduce dependence on one product.
b) Dynamic Pricing Strategy by using long-term contracts for the purchase of raw materials and sales of final products, so that price fluctuations can be minimized.
c) Promotion and Market Penetration by expanding export markets to developing countries with high demand for cooking oil through international trade shows and digital promotion.

4.6.2. Infrastructure Risk Mitigation

a) Port Improvement by accelerating the construction of modern ports that can handle high export volumes, including storage warehouses and automatic loading and unloading facilities.
b) Transportation Network Development by collaborating with the local government to improve access roads to KEK MBTK, so that the distribution of raw materials and products is more efficient.
c) Development of Supporting Facilities by building a Waste Water Treatment Plant (WWTP) with modern technology and increasing electricity capacity through partnerships with PLN or installing independent power plants.

4.6.3. Environmental Risk Mitigation

a) Application of Environmentally Friendly Technology, such as the use of waste treatment technology that meets AMDAL standards to minimize environmental pollution. Organic waste can be processed into biogas or organic fertilizer.
b) Conservation Program by conducting reforestation around KEK MBTK, including mangrove preservation, to reduce the impact of deforestation.
c) Efficient Water Management by using water recycling technology for production so that clean water needs do not interfere with the supply of surrounding communities.

4.6.4. Licensing and Regulatory Risk Mitigation

a) Acceleration of Licensing Process by establishing a special team at DPMPTSP (One Stop Integrated Investment and Service Agency) to handle licensing more quickly through direct coordination with OSS.
b) Fiscal Policy Advocacy by collaborating with the central government to maintain fiscal policy stability such as export tax rates and investment incentives.
c) Strengthening Land Legality by conducting mapping and dialog with the community to ensure there are no land conflicts and providing compensation or alternatives to affected parties.

4.6.5. Social Risk Mitigation

a) Local Community Empowerment by organizing job training for local communities to improve their skills to compete in the industry.
b) Partnership with MSMEs by integrating local MSMEs into the supply chain through cooperation contracts and access to capital, so that economic benefits are more equitable.
c) Dialogue and Socialization that involves the community in the planning and development stages of the project to build a sense of ownership and reduce resistance.

4.6.6. Operational Risk Mitigation

a) Improving the Quality of Raw Materials can be done by working with CPO mills to ensure the supply of raw materials according to quality standards through a quality certification system.
b) Diversification of Energy Supply using alternative energy sources such as biomass from palm oil waste to reduce dependence on conventional electricity supply.
c) Strengthening Technology and Human Resources by adopting the latest production technology and training the local workforce to manage the technology, so that potential operational disruptions can be minimized.

5. Conclusion

The palm oil-based cooking oil industry in the Maloy Batuta Trans Kalimantan Special Economic Zone (SEZ) faces a range of complex risks, including Crude Palm Oil (CPO) price fluctuations, infrastructure constraints, environmental pressures, social challenges and regulatory uncertainty. To support sustainability and competitiveness, an integrated risk management approach is needed, including product diversification, infrastructure development, application of environmentally friendly technology, and empowerment of local communities. With effective mitigation strategies, such as improving port facilities, implementing sustainability standards, and accelerating the licensing process, the SEZ has the potential to become a globally competitive palm oil downstream hub, while driving local economic growth and equitable development outside Java.

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