

## SUSTAINABILITY STRATEGY FOR INDONESIA'S CRUMB NATURAL RUBBER INDUSTRY: A SWOT–PESTLE STUDY of PT KIRANA MEGATARA Tbk.

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### Abstract

This study analyzes the internal and external conditions of PT Kirana Megatara Tbk (KMG) to develop strategic recommendations for its sustainable development. Using a qualitative approach, the study draws on secondary data from company reports, industry publications, and related sources. Analytical tools including SWOT, PESTLE, and Porter's Five Forces are applied to assess competitive dynamics. Document analysis—covering financial and sustainability reports as well as strategic presentations—forms the basis of the data collection. Strategic prioritization matrices are used to formulate actionable recommendations. The findings reveal that KMG holds a leading position in Indonesia's crumb rubber industry, supported by strong production capacity, solid 2024 financials, and a clear commitment to ESG principles. However, challenges persist, including declining sales volumes, reliance on volatile global prices, low productivity among smallholders, and operational complexity. Opportunities arise from increasing demand for sustainable (EUDR-compliant) rubber, market growth in China and India, and productivity gains via farmer partnerships and innovation. External threats include economic uncertainty, input competition, crop diseases, synthetic rubber substitution, and land-use shifts. The study contributes directly to KMG by offering a structured, evidence-based strategic roadmap to enhance competitiveness, resilience, and sustainability. The recommendations provide practical guidance for strengthening the value chain, meeting international standards, and expanding into high-potential markets. More broadly, the study contributes to strategic management literature by presenting an adaptive framework relevant for commodity-based firms facing sustainability regulations such as the EUDR and standards like FSC—culminating in strategic directions for short-, medium-, and long-term horizons.

**Keywords:** *Agribusiness, EUDR, Kirana Megatara, Natural Rubber, Strategic Management.*

### INTRODUCTION

The global natural rubber industry is confronting increasingly complex structural challenges driven by shifting demand patterns, mounting environmental regulations, and supply chain disruptions stemming from geopolitical tensions and climate change. More than 60% of global natural rubber demand comes from the tire industry, whose growth is closely tied to the automotive and infrastructure sectors. In recent years, however, both sectors have exhibited signs of slowdown, reflecting the broader impacts of global economic uncertainty (World Bank, 2025). At the same time, consumers and institutional buyers are demanding products that are sustainably produced, deforestation-free, and traceable to their raw material sources (Bertrand, 2025). A concrete manifestation of such pressure is the European Union Deforestation Regulation (EUDR), which will take full effect in December 2025 and requires all tropical commodity-based products to have a verified deforestation-free supply chain. In Indonesia—the world's second-largest natural rubber producer—the industry holds a strategic yet vulnerable position. The domestic supply chain is dominated by smallholder farmers, who contribute more than 85% of national output, creating distinct structural challenges. Productivity among Indonesian rubber farmers continues to lag behind competitors such as Thailand and Vietnam, due to limited access to technology, reliance on intermediary traders, and weak bargaining power (PISAgr, 2020). Furthermore, the stronger economic returns from other commodities, such as palm oil, have driven accelerated land conversion, threatening the long-term availability of rubber raw materials. PT Kirana Megatara Tbk (KMG), the largest crumb rubber producer in Indonesia, plays a central role in sustaining the competitiveness of the national natural rubber sector. With 14 factories across Sumatra and Kalimantan and an annual production capacity exceeding 800,000 tons, KMG commands substantial operational scale and market

influence. The company has been a pioneer in implementing sustainability standards, including FSC certification and full alignment with the EUDR, while maintaining long-term partnerships with major global buyers such as Michelin, Goodyear, and Pirelli. Yet despite this strong market position, KMG faces pressing strategic challenges: declining sales volumes, volatile global commodity prices, heavy dependence on the increasingly high-risk European export market, and the complexity of managing a smallholder-based supply chain amid intensifying domestic competition for raw materials (Kirana Megatara Tbk, 2025). From an academic standpoint, there remains a conceptual gap in the literature. Most prior studies have examined the natural rubber sector from a macroeconomic or public policy perspective, with relatively limited attention to how downstream companies such as KMG respond to external pressures through integrated strategic approaches. Given that tropical commodity-based industries are now increasingly shaped by stringent global standards, there is a need for an analytical framework capable of simultaneously capturing both external and internal business complexities. This study therefore integrates SWOT, PESTLE, and Porter's Five Forces analyses. SWOT offers a comprehensive mapping of internal and external factors; PESTLE examines the broader macro-environment; and Porter's Five Forces assesses industry competitive intensity. Using these frameworks in combination provides a strong methodological foundation for formulating data-driven, systematic, and context-specific strategies.

The primary objective of this study is to analyze the internal and external conditions of PT Kirana Megatara Tbk using an integrated SWOT-PESTLE-Porter's Five Forces approach to determine its strategic position in addressing global pressures, particularly the EUDR. The findings will inform the formulation of short- and medium-term development strategies aimed at strengthening competitiveness, enhancing supply chain resilience, and safeguarding both operational sustainability and partnerships with smallholder rubber farmers. Theoretically, this research seeks to enrich corporate strategy literature within the context of tropical commodity industries that are highly influenced by external dynamics and global regulatory frameworks. Practically, it is intended to provide strategic guidance for KMG's management in navigating regulatory uncertainty and global market disruptions.

Accordingly, this study seeks to answer the following research questions:

1. What are the internal and external conditions of PT Kirana Megatara Tbk in the context of the EUDR and global market volatility?
2. What are the company's key strengths and weaknesses in responding to these challenges?
3. What development strategies can be formulated to strengthen the company's competitiveness and sustainability in the short and medium term?

This study aims to offer not only academic contributions but also substantial practical relevance for businesses and policymakers in the sustainable commodities sector.

## LITERATURE REVIEW

In the context of this research, the sustainability theoretical framework analyzed using the SWOT-PESTLE approach is characterized by identifying the strengths, weaknesses, opportunities, and threats facing the rubber industry. Perdana's research underscores the importance of rubber downstreaming and the necessary government support to maintain competitiveness and product quality (Perdana, 2020). This downstreaming can support the development of additional industries, which will mitigate the impact of rubber price fluctuations in the international market. On the other hand, research conducted by Machmud et al. discusses strategies to improve the competitiveness and sustainability of the rubber industry in Indonesia (Machmud et al., 2022). These strategies relate to the implementation of innovations in production and marketing practices to address the sustainability challenges facing this sector.

## METHOD

This study adopts a qualitative field research design (Sugiyono, 2016) with a descriptive-analytical approach, selected for its suitability in exploring the internal and external strategic positioning of KMG within the global natural rubber industry. The methodological framework integrates three complementary analytical tools—SWOT, PESTLE, and Porter's Five Forces—to capture both the macro-environmental dynamics and industry-level competitive forces, as well as the internal organizational factors influencing corporate strategy. The SWOT analysis is employed to identify the company's internal strengths and weaknesses alongside external opportunities and threats (Humphrey, 2005); (Pearce & Robinson, 2020) Strengths refer to distinctive competencies such as human resources or management capabilities; weaknesses denote organizational limitations, such as inadequate facilities; opportunities represent favorable conditions that can be leveraged, such as supportive government policies; and threats encompass adverse conditions, such as the emergence of new competitors (Pearce & Robinson, 2020). The SWOT matrix allows

the integration of these factors to generate strategic alternatives (Dyson, 2004). To facilitate strategic formulation, the SWOT strategy matrix categorizes potential strategies into four quadrants: SO (Strength–Opportunity), ST (Strength–Threat), WO (Weakness–Opportunity), and WT (Weakness–Threat). SO strategies leverage organizational strengths to capitalize on external opportunities, ST strategies use strengths to mitigate external threats, WO strategies address weaknesses to exploit opportunities, and WT strategies focus on defensive measures to minimize vulnerabilities against threats. The model used in this study is illustrated in Figure 1.

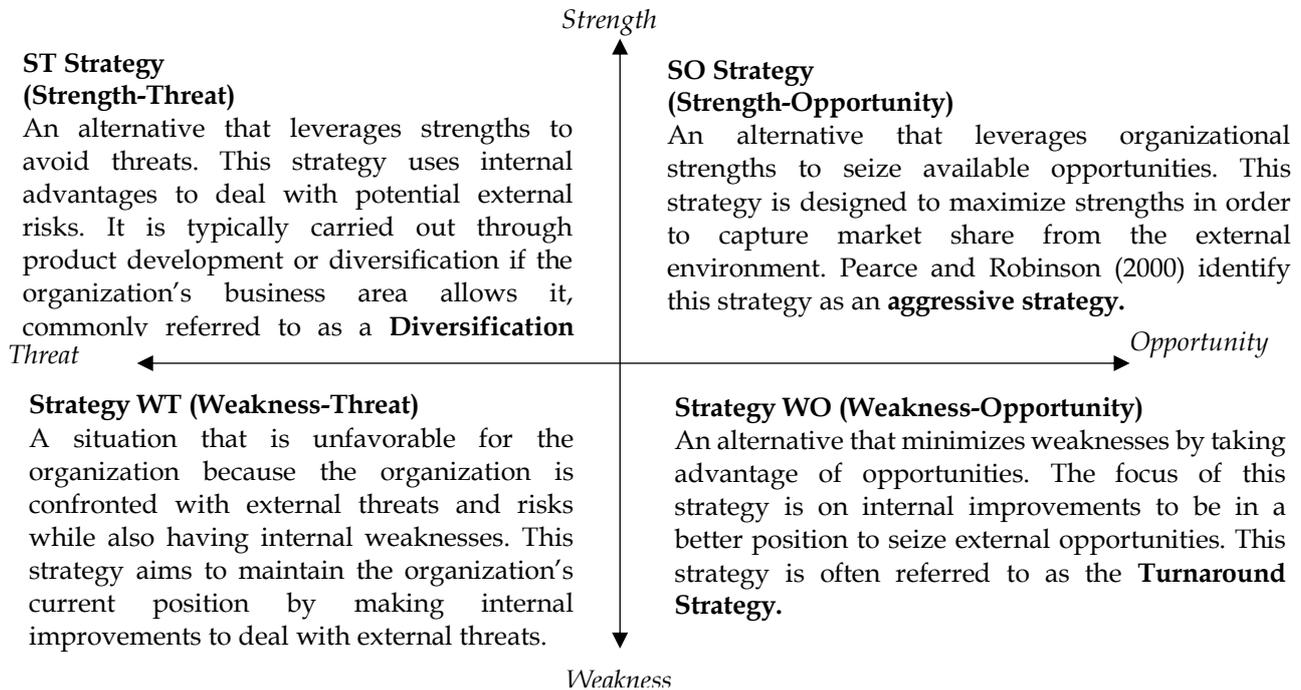


Figure 1. SWOT Strategy Matrix  
Source: Kosidin & Adi Wibowo, 2022

Complementing this, the PESTLE framework—Political, Economic, Social, Technological, Legal, and Environmental—provides a systematic evaluation of the macro-environmental factors that may influence the company's operations. In parallel, Porter's Five Forces framework is used to analyze the competitive structure of the natural rubber industry, focusing on the threat of new entrants, bargaining power of buyers, bargaining power of suppliers, threat of substitute products, and the intensity of rivalry among existing competitors. The combined application of these three frameworks offers a robust basis for formulating integrated strategic recommendations. The research utilizes both primary and secondary data. Primary data were collected through documentary analysis of KMG's internal corporate materials, including annual and sustainability reports for 2024 (Kirana Megatara Tbk, 2025) strategic presentations, and financial reports, which provide insight into operations, performance, vision, mission, and ongoing initiatives. Secondary data were obtained from relevant journals, industry publications, and macroeconomic reports issued by institutions such as the World Bank and OECD, as well as literature on environmental regulations (including the EUDR) and the global natural rubber market.

Documentary analysis was conducted in line with the approach described by (Sari & Asmendri, 2020), which involves gathering, reviewing, and synthesizing written documents, images, and other materials relevant to the research focus. Data analysis was carried out in several stages. First, SWOT analysis was conducted to map internal and external factors, forming the basis for strategy formulation in four quadrants—SO (Strength–Opportunity), WO (Weakness–Opportunity), ST (Strength–Threat), and WT (Weakness–Threat) (Dyson, 2004). Second, PESTLE analysis was performed to assess the broader macro-environment in which KMG operates. Third, Porter's Five Forces analysis was applied to evaluate the competitive intensity and industry attractiveness. Finally, strategic alternatives were prioritized using the SWOT matrix and a strategic positioning matrix (Aggressive, Diversification, Turnaround, Defensive) as proposed by (F. et al., 2020). This systematic integration of qualitative analysis tools enables the organization, articulation, and classification of relevant data into actionable strategic recommendations. The development of strategic options is anchored in KMG's vision, mission, and corporate objectives (Yudilla &

Amri, 2020), ensuring that the resulting strategies are both contextually relevant and aligned with the company's long-term goals.

## RESULTS AND DISCUSSION

### Subsection 1: Internal Environmental Analysis: Strengths and Weaknesses of PT Kirana Megatara Tbk

This section presents and discusses the internal analysis of PT Kirana Megatara Tbk (KMG), identifying its key strengths and weaknesses that shape its competitive position and future strategic direction. The analysis highlights KMG's significant market dominance and robust operational foundation while also pinpointing areas that require strategic attention. KMG possesses several core strengths that solidify its market leadership in the crumb rubber industry in Indonesia and provide a foundation for sustainable growth. These strengths, detailed in Table 1, paint a picture of a company with a strong market presence, a resilient operational model, and a commitment to global standards.

Table 1. Kirana Megatara's Strength Analysis

<b>Strength</b>	
<b>S1</b>	<p><b>Market Leadership and Scale</b></p> <p>KMG is a market leader in Indonesian rubber with a 24.2% export share of SIR in 2024. This dominance provides significant advantages in economies of scale, stronger bargaining power with suppliers and customers, and established brand recognition. With a total production capacity of 804,000 MT, the company's scale is a major competitive asset.</p>
<b>S2</b>	<p><b>Integrated and Extensive Operations</b></p> <p>KMG's operational network, comprising 14 processing plants and plantations across Sumatra and Kalimantan, allows for close proximity to raw material sources and improved logistical efficiency. This geographical diversification also mitigates the risk of over-reliance on a single supply region.</p>
<b>S3</b>	<p><b>Strong Financial Performance</b></p> <p>The company's financial health is robust, evidenced by a significant turnaround from a net loss in 2023 to a net profit of Rp 196,381 million in 2024. This was achieved despite a 6% drop in sales volume, indicating highly effective price and cost management and a strategic focus on high-value products. Healthy financial ratios provide the flexibility for future investments and strategic adaptation.</p>
<b>S4</b>	<p><b>Commitment to Sustainability and ESG</b></p> <p>KMG is a pioneer in shipping EUDR-compliant rubber from Indonesia. The company's certifications (e.g., FSC CoC) and good SPOTT rating demonstrate a strong commitment to environmental, social, and governance (ESG) standards. This proactive stance is a crucial long-term competitive advantage that opens access to premium markets and enhances the company's reputation amid increasing global demands for sustainability.</p>
<b>S5</b>	<p><b>Strong Partnerships</b></p> <p>Long-term partnerships with leading global customers like Goodyear and Michelin, coupled with sustainable programs for smallholder farmers, ensure stable demand and a reliable raw material supply. These strong relationships with a majority of its suppliers are vital for maintaining the continuity and quality of its upstream supply chain.</p>
<b>S6</b>	<p><b>Technological and Operational Efficiency</b></p> <p>Continuous investment in technology, such as the internal machinery development center (Nusira Workshop), use of biomass furnaces, and an integrated SAP ERP system, improves productivity and ensures consistent product quality. These efficiencies are critical for maintaining profit margins in a low-margin industry.</p>

Despite its strengths, KMG also faces several weaknesses that must be addressed to maintain its competitive edge. These weaknesses, outlined in Table 2, highlight operational and market vulnerabilities.

Table 2. Kirana Megatara’s Weakness Analysis

<b>Weakness</b>	
<b>W1</b>	<p><b>Sales Volume Decline</b></p> <p>The 6% decrease in sales volume in 2024, despite an increase in sales value, could signal challenges in maintaining market share or competing on volume in certain segments. This trend requires further analysis to understand if it's related to raw material supply issues or shifts in market demand.</p>
<b>W2</b>	<p><b>Vulnerability to Price Fluctuations</b></p> <p>Although KMG uses natural hedging strategies, its profitability remains highly susceptible to fluctuations in international rubber prices (TSR-20 SICOM). The company's limited control over its selling prices makes it vulnerable to global market volatility, despite its mitigation efforts.</p>
<b>W3</b>	<p><b>Dependence on Low-Productivity Smallholders</b></p> <p>Over 85% of KMG's raw material comes from smallholder farmers with significantly lower average productivity compared to other major producing countries. This high dependence on a low-productivity segment can limit potential for increasing production volume and ensuring consistent raw material quality, requiring continuous investment in partnership and empowerment programs.</p>
<b>W4</b>	<p><b>Operational Complexity</b></p> <p>Managing 14 geographically dispersed plants and plantations presents significant challenges in coordination, process standardization, and operational oversight. The large scale of operations increases management complexity and the risk of local inefficiencies, requiring a highly sophisticated control and monitoring system.</p>
<b>W5</b>	<p><b>Regulatory Uncertainty in Export Markets</b></p> <p>While KMG has been proactive in complying with the EUDR, the temporary hold on its implementation in Europe creates market uncertainty. Given that 95.4% of KMG's total sales are exports, the company is highly susceptible to regulatory changes in key markets, which could disrupt its premium product sales strategy.</p>

**Subsection 2: External Environmental Analysis: Opportunities and Threats of PT Kirana Megatara Tbk**

This section analyzes the external environment surrounding PT Kirana Megatara Tbk (KMG), identifying key opportunities it can leverage for growth and the threats it must navigate to ensure long-term stability. The analysis, supported by data in Tables 3 and 4, demonstrates how KMG can capitalize on global trends while mitigating significant market and environmental risks. KMG has several important opportunities to capitalize on, ranging from regulatory shifts to market and technological innovations

Table 3. Kirana Megatara's Opportunities Analysis

<b>Opportunities</b>	
<b>O1</b>	<p><b>Pioneering EUDR Compliance</b></p> <p>While initially a challenge, global environmental regulations like the <b>EU Deforestation Regulation (EUDR)</b> present a major opportunity. KMG's proactive stance as a pioneer in EUDR compliance allows it to meet strict European market demands for deforestation-free products. This position can strengthen its market share in the premium segment and attract sustainability-conscious customers.</p>
<b>O2</b>	<p><b>Market Diversification</b></p> <p>There is significant potential for KMG to explore <b>new markets outside of Europe</b>, particularly in China and India. By reducing its dependence on a single key market, KMG can diversify its risk and tap into growing economies with substantial rubber demand. This strategy is crucial for maintaining stable revenue amid global economic uncertainty.</p>
<b>O3</b>	<p><b>Empowering Smallholder Farmers</b></p> <p>KMG's partnership programs, which include providing seedlings and good agricultural practices (GAP) training, offer a smart, long-term strategy. By investing in smallholder farmers—its primary source of raw material—KMG can significantly <b>increase the quality and quantity of its supply chain</b>. This not only aligns with sustainability goals but also enhances supply security and builds a more resilient and ethical network.</p>
<b>O4</b>	<p><b>Product Portfolio Diversification</b></p> <p>KMG can explore opportunities beyond its primary focus on Standard Indonesian Rubber (SIR). By developing new <b>downstream products or advanced material innovations</b> like smart rubber, the company can reduce its reliance on the economically sensitive tire industry. This opens up new market segments with potentially higher profit margins and allows KMG to leverage its technological advantages.</p>
<b>O5</b>	<p><b>Biomass and Water Recycling</b></p> <p>The increased availability of biomass fuels (e.g., palm oil shells) and water recycling technologies offers a substantial <b>cost advantage and a reduced environmental footprint</b>. These efficiency gains support KMG's sustainability goals while also providing a significant competitive edge in an energy and water-intensive industry.</p>
<b>S6</b>	

KMG also faces significant threats from the external environment, which could impact its operational stability and profitability.

Table 4. Kirana Megatara's Threat Analysis

<b>Threat</b>	
<b>T1</b>	<p><b>Macroeconomic and Regulatory Volatility</b></p> <p>Weak global economic conditions, domestic political instability, and the temporary hold on EUDR implementation create significant market uncertainty. These macroeconomic fluctuations can directly affect <b>global rubber demand and depress prices</b>, requiring KMG to be highly adaptive and cautious in its strategic planning.</p>
<b>T2</b>	<p><b>Intense Raw Material Competition</b></p> <p>The high level of competition for raw rubber is expected to continue. This intense competition can <b>drive up raw material prices</b>, squeezing KMG's profit margins and potentially threatening supply continuity if procurement strategies are not managed effectively.</p>
<b>T3</b>	<p><b>Agricultural and Climate Risks</b></p>

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	Biological and climatic threats, such as the spread of <b>Pestalotiopsis leaf disease</b> and extreme weather events like La Niña, directly impact the availability and quality of raw rubber. This poses a significant supply risk and necessitates long-term mitigation strategies involving agricultural research and development.
<b>T4</b>	<b>Competition from Synthetic Rubber</b> While natural rubber has unique properties, <b>synthetic rubber</b> accounts for 57% of the global market. The potential for synthetic rubber to become more price-competitive, particularly if crude oil prices fall, could erode the market share of natural rubber and put downward pressure on demand and prices.
<b>T5</b>	<b>Land Conversion to Palm Oil</b> The trend of converting rubber plantations to more profitable palm oil plantations is a long-term <b>structural threat to the supply of natural rubber</b> . This trend could worsen KMG's raw material supply issues, highlighting the need for greater support and incentives for rubber farmers.
<b>T6</b>	<b>Government Policies</b> Recent government policies, such as the mandate to hold export earnings for three months in special bank accounts
<b>T7</b>	<b>Financial Policies</b> Unexpected <b>foreign exchange rate fluctuations</b> poses a direct financial risk. Given KMG's US dollar-denominated loans, unpredictable currency movements can lead to significant losses.

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### Subsection 3: Advanced External Analysis (PESTLE & Porter's Five Forces)

This section provides a detailed analysis of the external environment of PT Kirana Megatara Tbk (KMG) using the PESTLE and Porter's Five Forces frameworks. The goal is to identify macroeconomic factors and industry dynamics that shape the company's operational and strategic landscape.

#### PESTLE Analysis

In the political landscape, the uncertainty surrounding Indonesia's national policies in 2025, a year of leadership transition, is a key concern. Unpredictable changes could affect industry regulations, fiscal incentives, and macroeconomic stability, which in turn would impact KMG's operations, costs, and investment plans. At the international level, the temporary hold on the EU Deforestation Regulation (EUDR) until December 30, 2025, creates unpredictability for the future of the rubber industry. However, KMG has been proactive, successfully becoming the first rubber processing company in Indonesia to ship EUDR-compliant products to the European market since Q2 2024. While global environmental regulations like the EUDR create significant new non-tariff barriers, they also present a huge opportunity for prepared and compliant players. Furthermore, support from the Indonesian government for the rubber sector through downstreaming, restructuring of old factories, replanting incentives, and the implementation of the Indonesian National Standard (SNI) for processed rubber could create a more conducive environment for KMG's growth. However, the effectiveness of these programs' implementation on the ground still needs to be monitored, as research shows no clear indication of early success.

On the economic front, global growth is projected to slow to 2.3% in 2025, marking the slowest pace since 2008 outside of a global recession. This slowdown is driven by rising trade tensions and policy uncertainty. The growth projections for emerging market and developing economies (EMDEs) have also been revised downward across all regions. A global economic slowdown will directly depress demand for tires, which absorb about 60% of rubber consumption, and commodities in general. The price of natural rubber is highly volatile, influenced by speculation and crude oil prices, as synthetic rubber is a substitute. Brent crude oil prices are projected to fall to \$62 per barrel in the second half of 2025 and \$59 in 2026. A decline in crude oil prices could make synthetic rubber more price-competitive, which in turn could put downward pressure on the price of natural rubber. Global inflation, averaging 2.9% in 2025, remains above pre-pandemic levels. Tight financial conditions and high borrowing costs can weigh on investment and consumption. A high-interest-rate environment could increase KMG's financial burden, especially since the company relies heavily on bank loans with floating interest rates for working capital.

In the social sphere, the vulnerability of smallholder rubber farmers in Indonesia is increasing due to low rubber prices, the spread of plant diseases like Pestalotiopsis, which has reduced latex production by an average of 47.7% in South Sumatra, and declining government support. Many farmers are increasingly switching to palm oil cultivation due to its higher profitability, and a majority of them have other income sources besides rubber. These social and economic issues at the farmer level directly threaten the sustainability of KMG's raw material supply. There is a growing global trend where consumers are becoming more concerned about environmental issues, driving increased demand for sustainable rubber products, including bio-based rubber from renewable sources and recycled rubber products. KMG, which has been proactive in sustainability initiatives like EUDR compliance and FSC certification, is well-positioned to capitalize on these market trends. KMG demonstrates a strong commitment to local communities by employing 91.6% of its workforce from the areas around its factories and plantations.

From a technological perspective, the rubber industry continues to experience technological developments, including the introduction of 3D printing for rapid prototyping and on-demand production, the addition of nanomaterials like nanoparticles or nanofibers to enhance strength, elasticity, and durability, the development of smart rubber technology with integrated sensors for real-time monitoring, and the automation of production processes. These innovations aim to improve efficiency, precision, and material properties. KMG, with its internal machinery development center at PT Nusira and active implementation of the "yokoten" (best practice copy-paste) concept across its business units, has the capability to adopt and integrate these innovations. There is a growing trend in the development of bio-based rubber from renewable sources like dandelions and guayule, as well as rubber recycling technology, particularly for used tires. KMG's investment in research and development for alternative raw materials or recycling processes could reduce its dependence on pure natural rubber. Regulations like the EUDR demand proof of compliance through detailed documentation and geolocation data, which drives investment in data collection and verification technologies. KMG, which already uses an integrated SAP ERP system and has developed the Kiranalytics application, has a strong technological foundation.

In terms of legal aspects, KMG is committed to complying with all applicable laws and regulations, whether established by national authorities like the Financial Services Authority (OJK) regulations and Indonesian National Standards (SNI), or international standards like the EUDR. Strong legal compliance reduces the risk of litigation, fines, and administrative sanctions, which can damage a company's reputation and disrupt operations. The Indonesian government has restricted the issuance of new rubber processing plant licenses, as the existing number of companies is considered too high. This regulation requires a recommendation letter from the Department of Agriculture, certifying the availability of sufficient raw materials in the area, before a factory permit can be issued. KMG implements Good Corporate Governance (GCG) in accordance with OJK regulations, including the structure of its board of commissioners and directors, supporting committees, and a whistleblower system.

The environmental landscape is heavily defined by the EU Deforestation Regulation (EUDR), which will take effect on December 30, 2025. This regulation prohibits the marketing and export of products that contribute to deforestation and requires companies to have a due diligence system, conduct annual reporting, and provide geolocation data. KMG's readiness to meet these strict standards, even becoming a pioneer in EUDR-compliant shipments, is a strategic asset that enhances market access and differentiates the company from competitors. Indonesia is also prone to various natural disasters, such as earthquakes, floods, tsunamis, volcanic eruptions, and the threats of fires and disease outbreaks. Extreme weather events, such as the La Niña phenomenon, are also known to affect rubber production. The rubber processing process generates greenhouse gas (GHG) emissions, wastewater with high Chemical Oxygen Demand (COD) and Biochemical Oxygen Demand (BOD) parameters, and odor issues. KMG has been proactive in addressing these issues by setting GHG intensity reduction targets, managing waste through a wastewater treatment plant (IPAL) with an activated sludge system and the 3R principle (reduce, reuse, recycle), and increasing the use of biomass as a renewable energy source.

KMG has a clear commitment to not engage in deforestation and to not utilize peatlands in its operational areas. The threat of new entrants in the natural rubber processing industry is very low. The government limits the issuance of new rubber processing plant licenses because the number of existing companies is already considered excessive. This regulation requires a recommendation letter from the Department of Agriculture proving the availability of sufficient raw materials in the area before a factory permit can be issued. Furthermore, this industry has thin profit margins (<5%), so a large economy of scale is necessary to survive. This is a significant barrier to entry for any potential new competitors.

### Porter's Five Forces View

The bargaining power of buyers in the natural rubber industry is high. The main buyers are large global tire manufacturers, and the selling price is determined by the commodity market (TSR-20 SICOM). This places KMG as a 'price taker' of prices set by the international commodity market. The bargaining power of suppliers is at a moderate to high level. Over 85% of KMG's natural rubber raw material comes from smallholder farmers, which triggers intense competition for raw material procurement. KMG is attempting to mitigate this risk by targeting 30% of its supply directly from farmers through partnership programs and purchasing depots. The threat of substitute products, specifically synthetic rubber, is relatively low. Synthetic rubber accounts for 57% of the total global rubber market. Nevertheless, synthetic rubber cannot completely replace natural rubber (70% of which is absorbed by the tire industry) due to the unique characteristics of natural rubber, as well as the high conversion costs to switch entirely. The intensity of rivalry among existing competitors is very high. KMG, as the leader in SIR exports from Indonesia with a 24.2% share, faces fierce competition from over 130 other companies. This condition pushes KMG to continuously improve its production efficiency and achieve 100% traceability in its supply chain.

### Subsection 4: Strategic Formulation for PT Kirana Megatara Tbk

This section outlines the strategic development for PT Kirana Megatara Tbk (KMG), focusing on leveraging its strengths and opportunities to achieve aggressive growth. These strategies are designed to reinforce KMG's competitive advantage, mitigate weaknesses, and capitalize on promising market trends.

#### SO (Strengths-Opportunities) – Aggressive Strategies

The SO strategies leverage KMG's internal strengths to seize external opportunities, positioning the company for aggressive expansion and market leadership. The following strategies, detailed in Table 5, represent KMG's proactive approach to growth.

Table 5. Kirana Megatara's Aggressive Strategy Analysis

<b>Aggressive Strategy</b>	
<b>SO1</b>	<b>Optimizing Sales of Sustainable Premium Products</b> KMG should leverage its pioneering position in shipping <b>EU Deforestation Regulation (EUDR)</b> -compliant and Forest Stewardship Council (FSC)-certified rubber. The goal is to secure long-term contracts and expand its market share in Europe, while also actively promoting these advantages to a global market that is becoming increasingly sustainability-conscious.
<b>SO2</b>	<b>Aggressive Geographical Market Diversification</b> The company needs to accelerate its exploration and penetration of new markets beyond Europe, such as <b>China and India</b> . This includes pursuing tender sales to reduce its reliance on a single key market and mitigate risks associated with regional regulations and economic shifts.
<b>SO3</b>	<b>Improving Raw Material Quality and Quantity through Partnerships</b> KMG can utilize its long-term partnerships with smallholder farmers to enhance the number, intensity, and innovation of these collaborations. This includes providing Good Agricultural Practices (GAP) training, supplying superior seedlings, offering production assistance, and establishing purchasing depots. The objective is to boost the productivity and quality of raw rubber material (bokar) and reduce dependence on middlemen.
<b>SO4</b>	<b>Value-Added Product Innovation</b> By leveraging its internal machinery development center (Nusira Workshop) and other technological capabilities, KMG should invest in research and development (R&D) for value-added natural rubber products. This includes moving beyond standard SIR to products like SIR Mixture Rubber, specialized concentrated latex, or rubber products for non-tire applications, and integrating innovations such as nanomaterials or smart rubber technology.

### WO (Weaknesses-Opportunities) – Self-Improvement Strategies

This section outlines strategies for PT Kirana Megatara Tbk (KMG) that focus on leveraging external opportunities to address internal weaknesses. These self-improvement strategies are designed to strengthen the company's operational foundation and reduce its vulnerability to market fluctuations. The following points, detailed in Table 6, represent KMG's approach to proactive problem-solving and growth

Table 6. Kirana Megatara's Self-Improvement Strategy Analysis

<b>Self-Improvement Strategies</b>	
<b>WO1 Enhance Smallholder Farmer Productivity for Sales Volume</b>	To counter the decline in sales volume, KMG should intensify its partnership programs with smallholder farmers. By providing superior seedlings, training on good agricultural practices (GAP), offering production assistance, and building purchasing depots, the company can ensure a stable and high-quality raw material supply. This will, in turn, support an increase in production and sales volume.
<b>WO2 Mitigate Price Volatility with Market and Product Diversification</b>	KMG can reduce its dependence on volatile international rubber prices by accelerating its diversification into new markets like China and India. Concurrently, the company should develop value-added natural rubber derivatives or more advanced material innovations. These new products and markets can offer higher profit margins and are less sensitive to global commodity price fluctuations.
<b>WO3 Improve Operational Cost Efficiency Amid Network Complexity</b>	To maintain profitability in the face of volatile selling prices and raw material costs, KMG must continue and expand its efficiency programs, such as its Cost Reduction Program (CRP), the use of biomass furnaces, and the "yokoten" best practice sharing. These initiatives are essential for managing the complexity of its widespread operational network and ensuring long-term financial health.
<b>WO4 Value-Added Product Innovation</b>	By leveraging its internal machinery development center (Nusira Workshop) and other technological capabilities, KMG should invest in research and development (R&D) for value-added natural rubber products. This includes moving beyond standard SIR to products like SIR Mixture Rubber, specialized concentrated latex, or rubber products for non-tire applications, and integrating innovations such as nanomaterials or smart rubber technology.

### ST (Strengths-Threats) – Diversification and Innovation Strategies

This section outlines strategies for PT Kirana Megatara Tbk (KMG) that leverage the company's internal strengths to counter external threats. These diversification and innovation strategies, detailed in Table 7, are designed to protect KMG's market position, ensure operational resilience, and secure long-term sustainability amidst a challenging external environment.

Table 7. Kirana Megatara's Diversification and Innovation Analysis

<b>Diversification and Innovation Strategies</b>	
<b>ST1</b>	<p><b>Leveraging Market Leadership for Supply Resilience</b> KMG should use its position as a market leader in Indonesian crumb rubber and its extensive operational network to strengthen relationships with smallholder farmer suppliers and develop innovative procurement strategies. This will mitigate the risks posed by fierce competition for raw materials and the threats from plant diseases.</p>
<b>ST2</b>	<p><b>Enhancing Sustainability Commitment as a Competitive Advantage</b> The company needs to reinforce its commitment to sustainability and Environmental, Social, and Governance (ESG) principles, including EUDR and FSC certifications. This approach will help address the threat of strict global environmental regulations and enhance the company's reputation, providing a key competitive edge amid global economic uncertainty and intense market rivalry.</p>
<b>ST3</b>	<p><b>Utilizing Technology for Risk Mitigation</b> KMG should further develop its internal machinery center (Nusira Workshop) and integrated <b>SAP Enterprise Resource Planning (ERP)</b> system to boost productivity and quality. The company can also use its technological capabilities to seek effective solutions for threats like the Pestalotiopsis leaf disease and the impact of extreme weather, which threaten the raw material supply chain.</p>
<b>ST4</b>	<p><b>Reducing Dependence on the Tire Industry</b> KMG can leverage its long-term partnerships with leading global customers to explore and develop <b>rubber products for non-tire applications</b>. This will help reduce the threat of substitution from synthetic rubber and decrease the company's reliance on the tire industry, which is highly sensitive to economic cycles.</p>

### WT (Weaknesses-Threats) – Defensive Strategies

This section details the defensive strategies for PT Kirana Megatara Tbk (KMG), which focus on using the company's existing resources and capabilities to minimize the impact of external threats on its internal weaknesses. These strategies are designed to protect KMG's operational stability and ensure its long-term resilience in a challenging and uncertain environment. The following points, detailed in Table 8, outline the company's defensive approach.

Table 7. Kirana Megatara's Defensive Strategy Analysis

<b>Defensive Strategies</b>	
<b>WT1</b>	<p><b>Boosting Farmer Productivity to Mitigate Supply Risk</b> KMG should focus on continuous investment and innovation in its partnership programs with smallholder farmers. This is crucial for addressing both the issue of low productivity and the threat of land conversion from rubber to other crops. By doing so, the company can secure a stable and high-quality supply of raw materials, effectively navigating intense competition for sourcing.</p>
<b>WT2</b>	<p><b>Diversifying Funding and Hedging Strategies</b> To minimize the negative impact of volatile international commodity prices and unexpected foreign exchange rate movements, KMG should consider diversifying its funding sources. Additionally, it must refine its hedging strategies. These measures will help protect the company's financial health from external market instability.</p>
<b>WT3</b>	<p><b>Strengthening Supply Chain Traceability and Sustainability</b> The company must continue to improve the traceability of its raw materials, aiming for a <b>100% traceability ratio</b> across all supplier types. This effort is vital for ensuring compliance with increasingly strict</p>

regulations like the EUDR and for mitigating risks associated with changing policies and market demands.

**WT4 Developing Human Resources for Market Adaptation**

KMG should prioritize comprehensive human resource development and training programs at all levels. These programs should cover sustainable agricultural practices, operational management, and understanding ESG regulations. This will equip the company's workforce to adapt to market and technological changes, providing crucial support amid global economic uncertainty and environmental challenges.

## CONCLUSION

Based on the research objectives, the SWOT analysis and strategic formulation for PT Kirana Megatara Tbk (KMG) have been successfully conducted. The findings show that KMG holds a strong position in the Indonesian natural rubber industry, supported by significant production capacity, resilient financial performance in 2024, a strong commitment to sustainability (EUDR and FSC), and robust relationships with global customers and smallholder farmers. However, the analysis also confirmed weaknesses such as declining sales volume, commodity price volatility, dependence on low-productivity smallholder farmers, and operational complexity. The study's primary contribution lies in formulating a set of relevant and implementable strategic recommendations for KMG. These strategies are structured to leverage the company's strengths and opportunities while mitigating its weaknesses and threats. The findings contribute to the fields of agricultural socio-economics and agribusiness by demonstrating a practical approach to strategic management in a volatile commodity market. The research offers a clear roadmap for KMG to maintain its competitive edge and ensure long-term sustainability by focusing on both internal capacity building and external market adaptation. The limitations of this study are rooted in its reliance on secondary data available up to 2024/2025. The dynamic nature of the natural rubber market, rapid regulatory changes (e.g., EUDR), and geopolitical shifts could impact the future relevance and effectiveness of these strategic recommendations. Furthermore, the depth of the internal analysis may be limited by the availability of non-public information.

Based on these findings and limitations, the following recommendations are suggested for KMG:

- **Aggressively Expand Sustainability Certifications:** Given the tightening of environmental regulations like the EUDR and increasing market demand for sustainable products, KMG should aggressively expand its EUDR and FSC certifications to more factories and supply areas. It should also actively promote this advantage to the global market to secure premium contracts.
- **Invest in Smallholder Farmer Partnerships:** Continuous investment and innovation in partnership programs with smallholder farmers are key to addressing productivity issues and ensuring a stable, high-quality raw material supply. This could include developing more binding partnership models or direct investments in farmer communities.
- **Diversify Product Portfolio:** While the tire market remains crucial, KMG should actively explore non-traditional markets and develop value-added products (e.g., specialized rubber for other industrial applications). This will reduce dependence on a single market segment and mitigate the threat of synthetic rubber substitution.
- **Refine Financial Risk Management:** Due to the volatility of commodity prices and foreign exchange rates, KMG must continually refine its hedging strategies and diversify its funding sources to minimize the negative impact of market fluctuations.
- **Invest in Human Capital and Technology:** To maintain its competitive advantage, KMG should continue to invest in developing employee competencies and utilizing new technologies. This is essential not only for operational efficiency but also for product innovation and compliance with sustainability regulations.

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