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Palm Oil Derived Fatty Acid Supply Chain Deforestation and Conversion Risk Assessment Report

This report aims to comprehensively assess the potential deforestation and land conversion risks in the supply chain of palm oil-derived fatty acid products purchased by the company. With the growing global demand for sustainable palm oil and increasingly stringent regulatory requirements in regions such as the EU, supply chain transparency and sustainability have become key aspects of corporate risk management. The report will analyze the environmental and social impacts of the palm oil industry, assess current supply chain risks, and propose a comprehensive set of risk management strategies and improvement recommendations to help companies build a more resilient sustainable supply chain system.

Executive Summary

This risk assessment report systematically analyzes the deforestation and land conversion risks in the supply chain of palm oil-derived fatty acid products purchased by the company. As the world's largest vegetable oil, the deforestation problem in its production process has become the focus of international attention, especially in major producing countries Indonesia and Malaysia, where the expansion of oil palm plantations has led to the disappearance of a large number of original forests. The core findings show that the main risks in the palm oil supply chain are concentrated in the following aspects:

- Opaque raw material sources: About 41% of oil palm plantations in Malaysia and 26% in Indonesia are operated by smallholders, and these small plantations often lack a sound traceability system.
- Regulatory compliance risk: The EU's Zero Deforestation Regulation (EUDR) will be enforced in December 2024, requiring palm oil products entering the EU market to prove that they are not involved in deforestation after December 31, 2020
- Market and reputation risks: Many international brands face consumer boycotts and NGO criticism due to their supply chains being linked to deforestation
- Price volatility risk: Palm oil prices are expected to reach a record high of MYR 4,600 per tonne in 2025 due to climate factors and policy changes

Based on analysis of industry-leading practices, this report recommends that companies take the following key actions:

1. Establish a complete supply chain traceability system to achieve traceability from fatty acid products to oil palm plantations
2. Prioritize the purchase of RSPO-certified sustainable palm oil derivatives and gradually increase the proportion of physical supply chain (MB/SG)
3. Carry out supplier capacity building programs, especially sustainable cultivation training for smallholder farmers

4. Develop a public sustainable palm oil sourcing policy and disclose progress regularly
5. Engage in industry initiatives and multi-stakeholder collaborations to drive systemic change

Implementing these recommendations will help companies effectively reduce environmental and social risks in their supply chains, ensure business continuity, while enhancing brand reputation and meeting increasingly stringent regulatory requirements.

Introduction and Background

Palm oil and its derivatives, as the most widely used vegetable oil in the world, have become indispensable raw materials for modern industry. From food, cosmetics to detergents and biofuels, fatty acid products derived from palm oil are widely used due to their unique physical and chemical properties and economic efficiency. Global palm oil production increased from 74.17 million tons in 2018 to 77.58 million tons in 2022, of which Indonesia and Malaysia contributed about 84% of the production, with a total oil palm planting area of 19 million hectares in the two countries. However, behind this huge industry are serious environmental and social challenges.

Deforestation and land conversion have become the most controversial issues in the palm oil industry. According to the United Nations Development Program, the conversion of native forests to oil palm plantations will lead to an 83% reduction in the original species richness. According to World Bank statistics, more than 26.4 million hectares of primary forest disappeared in Indonesia between 1990 and 2020, and the area of oil palm plantations in the country surged from 1.1 million hectares to 16.38 million hectares during the same period. This large-scale forest conversion not only leads to biodiversity loss, but also releases a large amount of stored carbon, exacerbating climate change. It is estimated that deforestation and forest degradation contribute about 10% of global greenhouse gas emissions.

The international community and regulators continue to pay more attention to this issue. In 2018, the EU revised the Renewable Energy Directive (REDII) and plans to phase out palm oil-based biofuels by 2030. In June 2023, the EU's Zero Deforestation Regulation (EUDR) officially came into effect and will be enforced on December 30, 2024, prohibiting the sale of seven commodities involving deforestation in the EU market, including palm oil. The law requires companies to conduct due diligence to prove that their products are not involved in deforestation after December 31, 2020, otherwise they will face fines, confiscation of products and other penalties.

The complexity of the supply chain makes the sustainable sourcing of palm oil-derived fatty acid products a huge challenge. The palm oil supply chain usually involves multiple intermediate links: from oil palm plantations to crushing plants, refineries, derivative producers, and finally to end-product manufacturers. Especially in the field of derivatives such as fatty acids, the raw materials are often mixed and processed many times, making it extremely difficult to trace the original planting source. In addition, about 30-40% of oil palm in Indonesia and Malaysia is grown by smallholders, and these small producers usually lack the resources and technical capabilities to implement sustainable practices or participate in certification programs.

Corporate risk awareness is increasing rapidly. More and more consumer goods companies and chemical companies realize that deforestation risks in the supply chain are not only related to corporate reputation, but may also affect market access and financing conditions. The 2024 report of the Environmental Investigation Agency (EIA) shows that palm oil suppliers of many

multinational companies are linked to illegal deforestation in the Peruvian Amazon, which has aroused widespread concern. At the same time, the demand for sustainable products from investors and consumers continues to grow, prompting companies to strengthen supply chain transparency and management.

The purpose of this report is to help companies systematically identify, assess and manage deforestation and conversion risks in their palm oil derived fatty acid supply chains, draw on industry best practices, and develop practical improvement plans to ensure the sustainability and compliance of their supply chains while meeting the growing expectations of stakeholders.

Analysis of the current situation of palm oil industry and deforestation

The global palm oil industry is highly concentrated, whether in production, trade or consumption. As the world's largest vegetable oil, the global production of palm oil will reach 77.58 million tons in 2022, of which Indonesia will contribute 46 million tons (59.3%) and Malaysia will contribute 18.6 million tons (24%), accounting for more than 83% of the two countries. In terms of planted area, the total global oil palm planted area in 2022 will be 26.519 million hectares, of which Indonesia alone will account for 13.5 million hectares (50.9%), Malaysia will account for 5.5 million hectares (20.7%), and Nigeria will account for 3 million hectares (11.3%). This geographical concentration allows supply chain risk assessment to focus on a few key production areas, but it also increases the impact of regional risks on the global market.

Deforestation status in producing countries

Indonesia and Malaysia are the world's two largest palm oil producers, and the correlation between the expansion of oil palm plantations and deforestation has been widely documented. According to the World Bank, Indonesia lost more than 26.4 million hectares of primary forest between 1990 and 2020, while the country's oil palm plantations expanded from 1.1 million hectares to 16.38 million hectares during the same period. The United Nations Development Programme report pointed out that the conversion of primary forests and logged forests to oil palm plantations will lead to an 83% reduction in species richness. In Malaysia, especially in Sabah and Sarawak , the expansion of oil palm plantations has also come at the expense of tropical rainforests, threatening the habitats of endangered species such as orangutans and pygmy elephants .

Deforestation is also becoming an increasingly prominent problem in emerging production areas such as Peru and Colombia. A 2024 report by the Environmental Investigation Agency (EIA) revealed that palm oil and cocoa companies in the Peruvian Amazon have driven large-scale deforestation, involving more than 13,000 hectares of illegal clearing . More worryingly, the Peruvian Congress recently passed an amendment to the Forest Law that condones historical illegal logging, which could lead to more forests being converted to agricultural land. Weak supervision and lack of governance in such emerging production areas pose additional challenges to supply chain risk assessment.

Palm oil trade flows and market dynamics

The global palm oil trade pattern shows obvious "South to North" and "East to West" characteristics. In 2022, the global palm oil export volume was 49.4 million tons, of which Indonesia

accounted for 57.1% (28.2 million tons) and Malaysia accounted for 32% (15.8 million tons). Imports are relatively scattered, with major importing countries including India (8.3 million tons), China (7.2 million tons), the European Union (5.9 million tons) and Pakistan (3.6 million tons). It is worth noting that China, as the world's second largest palm oil importer and third largest consumer, has an overall downward trend in imports from 2018 to 2022, with imports of 4.9435 million tons in 2022, the lowest in the past five years.

Price volatility and market uncertainty are exacerbating supply chain risks. Malaysian Rating Corporation Bhd (MARC Ratings) predicts that palm oil prices could reach an all-time high of 4,600 ringgit per ton in 2025. The main drivers of price increases include reduced exports from Indonesia, adverse weather conditions in Malaysia, and policy restrictions in markets such as the European Union. Such price volatility not only affects procurement costs, but can also cause suppliers to ignore sustainable practices in pursuit of short-term profits, increasing deforestation risks.

The role and challenges of smallholder farmers in the supply chain

Smallholder cultivation plays an important role in major producing countries. According to 2022 data, 41% of the oil palm plantations in Indonesia and 26% of the plantations in Malaysia are operated by smallholders. These smallholders usually lack the financial, technical and management capabilities to implement sustainable planting practices, and find it difficult to bear the certification costs. The implementation of the EU's Zero Deforestation Act may exclude these smallholders from the global supply chain and seriously affect their livelihoods. Indonesia and Malaysia have protested to the WTO many times, believing that the bill actually creates import barriers and excludes agricultural products from developing countries.

Smallholders face multiple obstacles in integrating into sustainable supply chains. First, unclear land ownership is a common problem in many production areas, and smallholders are often unable to provide legal proof of land ownership. Second, imperfect production records and traceability systems make it difficult for their products to meet the due diligence requirements of markets such as the EU. Third, market information asymmetry and exploitation by middlemen have resulted in limited price premiums for smallholders, and a lack of economic motivation to participate in sustainable certification. These structural challenges require collaboration across the industry to be effectively addressed.

Table: Planting area structure of major palm oil producing countries (2022)

nation	Total planting area (10,000 hectares)	Proportion of small farmers (%)	Proportion of corporate plantations (%)
Indonesia	1350	41	59
Malaysia	550	26	74
Nigeria	300	/	/
Global Total	2651.9	About 30-35 (estimated)	About 65-70 (estimated)

Supply Chain Risk Assessment Framework

Establishing a systematic risk assessment framework is the basis for managing deforestation and conversion risks in the palm oil derived fatty acid supply chain. This section will elaborate on the assessment method, risk classification system and specific assessment indicators to provide companies with a set of operational supply chain risk assessment tools. This framework combines internationally recognized standards, industry best practices and the particularities of the palm oil supply chain to ensure that the assessment results are both comprehensive and targeted.

Risk Assessment Methodology

Supply chain mapping and tracing are the first steps in risk assessment. For palm oil-derived fatty acid products, the complete supply chain usually includes the following links: oil palm plantation → fresh fruit bunch purchasing station → palm fruit crushing plant → palm oil refinery → fatty acid production plant → final product manufacturer. Risk assessment needs to be traced along this chain step by step to identify the potential deforestation and land conversion risks at each link. In actual operation, the "back-to-front" traceability method can be adopted, first requiring direct suppliers to provide raw material source information, and then gradually moving upstream to the plantation level.

The sources of risk assessment data should be diversified, including but not limited to: supplier questionnaires, on-site audit reports, third-party certification data, satellite monitoring images, government land use records, non-governmental organization research reports, etc. Geographic Information Systems (GIS) and remote sensing technologies are also increasingly used in monitoring forest cover changes. Platforms such as Global Forest Watch provide near real-time forest change alerts.

The risk assessment cycle should match the business cycle and risk dynamics. It is recommended to conduct a comprehensive risk assessment at least once a year, and the assessment frequency should be increased for high-risk suppliers or production areas. At the same time, an immediate response mechanism for major risk events should be established. For example, when large-scale illegal logging in a production area is exposed, the potential impact on the company's supply chain can be quickly assessed and corresponding measures can be taken.

Risk classification and rating system

Deforestation and conversion risks can be categorized according to their source and nature as follows:

1. Direct deforestation risk: refers to the clearing of primary forests, protected forest lands or high carbon stock (HCS) areas directly caused by oil palm planting. This is the most serious type of risk and may lead to regulatory penalties, brand reputation damage and market access restrictions. Assessment indicators include: plantation development time (whether it is after December 31, 2020), vegetation type before land conversion, whether there is any encroachment on protected areas, etc.

2. Indirect deforestation risk (ILUC): refers to the indirect change of land use caused by oil palm planting, such as converting other agricultural land to oil palm planting, forcing the original crop planting to expand into forest areas. The ILUC standard in the EU Renewable Energy Directive (REDII) is aimed at this type of risk. Assessment indicators include: regional land use change patterns, crop planting structure adjustment trends, etc.

3. Social compliance risk : refers to land ownership conflicts, infringement of indigenous rights, labor rights issues, etc. related to oil palm planting . Although not directly related to deforestation, these social issues are often intertwined with environmental damage. Assessment indicators include: the legality of land acquisition procedures, the implementation of free prior informed consent (FPIC), labor conditions, etc.

4. Regulatory compliance risk : refers to the legal consequences and business losses caused by non-compliance with domestic and international regulatory requirements. The EU's Zero Deforestation Directive (EUDR) and the sustainable palm oil policies of various countries constitute the main regulatory framework. Evaluation indicators include: whether the product meets the sustainability requirements of the target market, the compliance record of the supplier , etc.

Risk rating can be a three-level or five-level system, which is based on the possibility of risk occurrence and the severity of the impact. For example:
- High risk: There is clear evidence that the supplier is involved in primary deforestation or peatland development; cannot provide reliable traceability information; has repeatedly violated environmental regulations.
- Medium risk: Some plantations are located in secondary or degraded forest land but there is no clear sustainable management plan; traceability systems are incomplete but improving.
- Low risk: The plantation is located on existing agricultural land with no history of forest conversion; it has a sound traceability system and sustainable certification.

Key evaluation indicators

The risk-based assessment indicator system should quantify the manifestation and severity of various risks. The following are the core assessment indicators for the palm oil derived fatty acid supply chain:

Table: Deforestation risk assessment indicators for palm oil derived fatty acids supply chain

Indicator Category	Specific indicators	Data Source	Risk level judgment criteria
Land use history	Plantation development time	Land ownership documents, satellite images	Development after December 2020 is considered high risk
	Land type before conversion	Historical satellite imagery, government records	Primary forest or peatland is high risk

	Distance from protected area	GIS Spatial Analysis	Plantations in buffer zones face higher risk
Sustainable Practices	RSPO certification status	RSPO certificate, supply chain model	Not certified as high risk, MB/SG is better than B&C
	High Conservation Value (HCV) Assessment	HCV Assessment Report	Risks that are not assessed or are incompletely assessed
	Peatland Management Policy	Company policy documents, on-site audits	No policy or poor policy implementation is a risk
Traceability and transparency	Supply chain traceability	Supplier investigation and traceability system testing	High risk if traceability to plantation is not possible
	Third-party verification ratio	Audit reports, certification data	Low verification ratio increases risk
Social Compliance	Clarity of land ownership	Land title documents, community interviews	Ownership disputes are high risk
	FPIC Implementation	Community consultation records	Failure to implement FPIC is a high risk
	Labor Rights Protection	Labor policies, audit findings	High risk of forced labor or child labor

The risk heat map tool can visually present the risk distribution of different suppliers and production areas. After integrating the evaluation results of the above indicators, a risk heat map based on the geographic information system (GIS) can be drawn to help procurement decision makers quickly identify high -risk areas and optimize the supplier portfolio. For example, large-scale illegal logging activities have recently been exposed in the Amazon region of Peru. Suppliers in this area should be marked as high-risk and need to strengthen due diligence or consider alternative sources.

The dynamic nature of risk assessment cannot be ignored. Palm oil supply chain risks are constantly evolving with policy changes, market fluctuations and environmental conditions. For example, Malaysia and Indonesia’s response to the EU’s Zero Deforestation Directive, or the impact of climate anomalies on plantation yields, may change the risk profile of a specific region. Therefore, the risk assessment framework should be flexible enough to incorporate new risk factors and information updates in a timely manner.

Roundtable on Sustainable Palm Oil (RSPO) certification system

RSPO certification has become the industry's recognized main standard for sustainable palm oil. The certification system includes eight principles and 39 standards, covering legal compliance , environmental protection, community rights and other aspects. As of 2022, the global RSPO certified area has reached 4.5 million hectares, distributed in 21 countries, protecting more than 301,000 hectares of gardens. RSPO-certified palm oil can reduce carbon emissions by about 35% compared to traditional palm oil.

The RSPO supply chain model provides four traceability options, in descending order of strictness: Identity Preserved (IP) , Segregated (SG), Mass Balance (MB) and Book & Claim (B&C).

RSPO faces unique challenges in promoting its products in China. As the world's second largest palm oil importer, China's purchase of sustainable palm oil reached only 8% in 2021, which is still far from the 10% target set by RSPO. The main obstacles include low awareness among end consumers, the "invisibility" of palm oil in product labels (often marked as "vegetable oil" or chemical names), and the lack of motivation for companies to purchase. In response to these challenges, the strategies adopted by RSPO China include: driving local suppliers through multinational companies, promoting leading Chinese companies to join RSPO, and participating in policy formulation.

Strategies for dealing with new EU regulations are particularly noteworthy. As the implementation of EUDR approaches, leading companies are strengthening their supply chain due diligence systems to ensure that they can prove that their products are not involved in deforestation after December 2020. This includes collecting more detailed origin information, investing in traceability technology, and working with suppliers to address compliance challenges .

Risk management and improvement suggestions

Based on a comprehensive risk assessment and industry best practice analysis, this section proposes targeted risk management strategies and improvement suggestions to help companies effectively reduce deforestation and conversion risks in the palm oil-derived fatty acid supply chain. These suggestions cover multiple dimensions such as policy formulation, supplier management, traceability system construction, and stakeholder engagement, forming a systematic risk management framework. Implementing these measures will not only help with compliance and risk avoidance, but also enhance the company's sustainable image and create long-term competitive advantages.

Developing a sustainable palm oil sourcing policy

A clear written policy is the foundation and public commitment for sustainable procurement. It is recommended that companies formulate and publish a "Responsible Palm Oil Derivatives Procurement Policy" which should include:

1. Zero Deforestation Commitment: Explicitly exclude palm oil raw materials involving the development of primary forests, High Carbon Stock (HCS) forests, High Conservation Value (HCV) areas and peatlands, in line with the timeline of the EU Zero Deforestation Directive, that is, raw

materials involving deforestation after December 31, 2020 will not be accepted.

2. Certification target: Set a clear timeline for gradually increasing the proportion of RSPO certification, achieving 100% RSPO certified supply by 2025, of which at least 50% comes from the physical supply chain (MB/SG)". This target should be regularly evaluated and updated to reflect business developments and market changes.

3. Supplier expectations: All palm oil derived fatty acid suppliers are required to comply with the company's sustainable procurement principles, provide complete supply chain traceability information, and cooperate with third-party audits. The policy should clearly state the consequences of non-compliance, including re-evaluation of the business relationship.

4. Smallholder inclusion: Commit to supporting the sustainable transformation of smallholders and helping them meet sustainable standards through capacity building, technical assistance or financing support. This is the key to solving the problem of smallholder inclusion and is also an issue of great concern to the governments of Malaysia and Indonesia.

5. Transparency and reporting: Commit to publicly disclose the progress of the implementation of procurement policies and objectives on a regular basis (at least annually), including indicators such as the RSPO certification ratio, traceability coverage, and supplier compliance. Transparency building is the key to winning the trust of stakeholders.

Establish a complete supply chain traceability system

End-to-end traceability is the core technical foundation of risk management. In view of the special complexity of the palm oil derived fatty acid supply chain , the following measures are recommended:

1. Supply chain mapping: First, draw a complete supply chain map to identify all direct and indirect suppliers down to the plantation level. For links that cannot be directly traced (such as the mixing process in derivative production), suppliers are required to provide mass balance records or transaction certificates.

2. Digital traceability platform: Invest in or purchase a supply chain traceability management system to integrate data, certification information, audit reports, etc. provided by suppliers. Consider using blockchain technology to enhance the immutability of data, especially for high-risk areas and suppliers.

3. Geolocation verification: Use satellite imagery and GIS technology to verify plantation locations and land use history. Platforms such as Global Forest Watch provide forest change alerts that can help identify new deforestation activity.

4. Third-party audit: Conduct on-site audits of high-risk suppliers and production areas to verify the authenticity of the information they provide. The audit should cover both environmental and social dimensions, with special attention paid to sensitive issues such as land ownership, FPIC process, and labor conditions.

5. Continuous monitoring: Establish a continuous monitoring mechanism for the supply chain rather than a one-time assessment. Set key risk indicators (KRIs) and warning thresholds to trigger special investigations when abnormal situations are found (such as a sudden large amount of forest loss alerts in a production area).

The implementation of the traceability system should be carried out in stages, with priority given to covering high- risk products and suppliers. It is acceptable that some supply chains are not yet fully transparent in the early stages, but a clear timetable must be established to gradually increase the traceability coverage. At the same time, attention should be paid to the protection of data privacy and commercial secrets, and a balance should be struck between transparency and reasonable confidentiality.

Supplier Capacity Building and Engagement

Suppliers are key partners in risk management rather than just compliance targets. Given that about 30-40% of oil palm in Malaysia and Indonesia is produced by smallholders, it is neither realistic nor fair to exclude them from the supply chain. The following engagement strategies are recommended:

1. Supplier classification: Suppliers are classified into three categories: high, medium and low risk according to the risk assessment results, and differentiated management measures are designed for different levels. High-risk suppliers need to be rectified or replaced immediately; medium-risk suppliers can be given opportunities to improve; and low-risk suppliers can establish closer partnerships.
2. Capacity building project: Provide training and technical support to suppliers (especially collective organizations of small farmers) who are willing to improve but lack the capacity, including sustainable planting practices, record keeping, certification preparation, etc. This can be carried out in conjunction with RSPO, industry associations or other buyers to share the cost.
3. Economic incentives: Providing a price premium or long-term purchasing commitments for sustainably produced ingredients to cover suppliers' certification and compliance costs. This "sustainability premium" is an effective means of incentivizing behavioral change, especially for smallholder farmers.
4. Complaint and Correction Mechanism: Establish a formal complaint process. When a supplier is found to be non- compliant, first give them an opportunity to correct the situation rather than immediately terminate the cooperation.
5. Collective action initiatives: Participate in or initiate industry collective action projects, such as the Sustainable Palm Oil Initiative (SPOA) or regional smallholder support programs. Collective action can share costs, pool resources, and avoid duplication of efforts.

The key to supplier engagement is to build long-term mutually beneficial relationships rather than simply exerting pressure. Through regular dialogue, joint problem solving and capacity building, sustainability requirements can be transformed into internal motivation for suppliers, thereby achieving real behavioral change and continuous improvement.

Stakeholder Engagement and Industry Collaboration

Deforestation is a systemic challenge that requires collaboration across sectors and value chains. Companies are advised to strengthen external engagement in the following ways:

1. Join RSPO: Become a member of the Roundtable on Sustainable Palm Oil and participate in standard setting and industry dialogue. RSPO has more than 300 members in China, forming a localized knowledge network and cooperation platform.
2. Policy dialogue: Pay attention to and participate in the formulation of relevant laws and regulations, such as the implementation rules of the EU Zero Deforestation Directive, China's possible sustainable palm oil policy, etc. Express industry concerns and feasible suggestions through industry associations or joint statements.
3. NGO and academic cooperation: Establish dialogue and cooperation channels with environmental protection organizations such as the World Wildlife Fund (WWF), Greenpeace, and research institutions. These organizations usually have cutting-edge forest monitoring data and in-depth insights into production areas, which can supplement the company's risk assessment.
4. Consumer education: Although fatty acid derivatives are not directly for consumers, they can support consumer education at the industry level and increase awareness of sustainable palm oil. RSPO China’s experience shows that increasing consumer awareness can create a market pull effect.
5. Investor communication: Incorporate sustainable palm oil sourcing progress into ESG reports and maintain regular communication with investors who are concerned about the environment and social responsibility. More and more investors are using forest protection as an important indicator for evaluating companies.

The key to collaboration is to clarify goals, contribute expertise, and measure impact. Avoid "collaboration for the sake of collaboration" and ensure that each participation can bring substantial risk reduction or improvement opportunities. At the same time, pay attention to balancing the expectations of different stakeholders and find solutions that all parties can accept.

Implementation Roadmap and Resource Allocation

Translating recommendations into concrete action plans requires a clear implementation roadmap and resource guarantees. It is recommended to proceed in the following stages:

Table: Implementation roadmap for palm oil derived fatty acid supply chain risk management

Timeframe	Key Actions	Responsible Department	Success Indicators
2022-2023	1. Establish a cross-departmental working group 2. Develop a draft sustainable procurement policy 3. Conduct a preliminary supply chain risk assessment	The procurement department takes the lead, with participation from departments such as sustainable development and legal affairs	Working group established; draft policy completed; high-risk suppliers identified

Timeframe	Key Actions	Responsible Department	Success Indicators
2023-2024	1. Officially release procurement policy 2. Conduct supplier survey 3. Select and deploy traceability system 4. Join RSPO	Purchasing Department, IT Department	Policy released; supplier survey completion rate > 80%; system selection confirmed; RSPO membership obtained
2025	1. Audit of key suppliers 2. Launch of capacity building project 3. First sustainable procurement ratio report 4. Establishment of complaint mechanism	Purchasing Department, Sustainable Development Department	High-risk supplier audit coverage rate 100%; training program launched; first report released; mechanism established
2025-2030	1. Expand traceability coverage 2. Participate in industry collaboration initiatives 3. Evaluate policy effects and adjust 4. Explore innovative solutions	Cross-departmental team	Traceability covers major product lines; participates in 1-2 industry projects; policy revisions completed; innovation pilot launched

Key findings from the risk assessment

Supply chain risks is the first finding of the assessment. 83% of global palm oil production is concentrated in Indonesia and Malaysia, and oil palm cultivation in these two countries has a historical connection with deforestation. According to World Bank data, Indonesia lost more than 26.4 million hectares of primary forest between 1990 and 2020, and the area of oil palm cultivation

expanded from 1.1 million hectares to 16.38 million hectares during the same period. This geographical and industrial concentration means that risk management can focus on a few key areas, but it also increases the risk of regional events impacting the global supply chain.

The challenge of integrating smallholders poses a special complexity to risk management. 41% of the oil palm planted area in Indonesia and 26% in Malaysia is operated by smallholders, who often lack the resources and technical capacity to implement sustainable practices or meet increasingly stringent traceability requirements. The implementation of the EU's Zero Deforestation Directive could exclude these smallholders from the supply chain, causing livelihood issues and social backlash. It is neither realistic nor fair to completely avoid smallholder sources, and how to support their transition to sustainable production has become a common challenge for the industry.

The opacity of the derivative supply chain increases the difficulty of traceability. Compared with crude oil, palm oil-derived fatty acids are usually processed and mixed multiple times, and the original planting information is easily lost in the supply chain. Companies are far away from the origin of palm oil and palm kernel oil. This opacity requires risk assessment to rely on a combination of supplier declarations, certification systems and sampling verification, rather than complete end-to-end traceability.

The rapid evolution of the regulatory environment has brought new compliance requirements. The EU's "Zero Deforestation Directive" will be enforced on December 30, 2024, requiring companies to prove that their products do not involve deforestation after December 31, 2020. At the same time, countries such as Malaysia and Indonesia have filed complaints with the WTO, arguing that such regulations constitute trade barriers. This policy dynamism requires companies' risk management systems to be flexible and adaptable.

The value proposition of a risk management strategy

Proactive risk management can create multiple values for companies, far beyond simple compliance and risk avoidance:

1. Business continuity guarantee: By ensuring that the supply chain complies with the regulatory requirements of major markets (such as EUDR), the risks of business interruption such as product rejection, fines or confiscation can be avoided. As more and more countries and regions introduce similar regulations, planning a sustainable supply chain in advance will become a prerequisite for market access.
2. Enhanced brand reputation: Against the backdrop of growing environmental awareness, responsible sourcing practices can enhance brand reputation and differentiate market positioning. On the contrary, as shown in the EIA report, supply chains associated with deforestation may trigger consumer boycotts and NGO criticism.
3. Cost and supply stability: Although sustainable palm oil may increase costs in the short term, it will help stabilize supply relationships in the long run and reduce supply chain shocks caused by environmental disputes or regulatory changes.
4. Innovation and collaboration opportunities: Participation in sustainable palm oil initiatives such

as RSPO can bring industry networking, knowledge sharing and joint innovation opportunities. These intangible assets may translate into new products, new markets or efficiency gains.

5. Investor attractiveness: More and more investors are incorporating environmental and social governance (ESG) factors into their decision- making. Perfect sustainable supply chain management can improve ESG ratings and gain the favor of more responsible investors.

The path to value realization lies in integrating risk management into core business decisions rather than viewing it as an additional compliance burden. Procurement decisions should take into account price, quality and sustainable performance, establish long-term partnerships based on common values with strategic suppliers, and gradually extend sustainability requirements to the wider supply chain.

Take Action Now (Update 2025: 1-4 Completed)

1. Form a cross-functional team: Led by the procurement department, a sustainable palm oil working group will be established in conjunction with the sustainability, legal, and R&D departments to be responsible for strategy formulation and execution supervision. The responsibilities and key performance indicators of each member will be clarified.

2. Develop and publish a procurement policy: Draft a "Responsible Palm Oil Derivatives Procurement Policy" that includes core elements such as zero deforestation commitment, certification targets, and supplier expectations. The policy development process should consult key suppliers and internal stakeholders.

3. Conduct supplier risk assessment: Conduct preliminary risk screening of existing palm oil derived fatty acid suppliers, focusing on: origin of raw materials (whether they come from high-risk areas in Indonesia/Malaysia), certification status, traceability, etc. Suppliers are graded based on risk assessment results and differentiated management strategies are developed.

4. Join RSPO: Apply to become a member of the Roundtable on Sustainable Palm Oil, participate in relevant training and activities, and learn about industry best practices. RSPO China has more than 300 members, forming a localized knowledge network.

5. Invest in a traceability system: Evaluate and select a supply chain traceability solution that fits your company's size and needs, which may include a blockchain platform, GIS tools, or professional supply chain management software. Initially, high -risk products and suppliers may be prioritized, and coverage may be gradually expanded.

6. Initiate supplier communication: Communicate the company's sustainable procurement policy to existing suppliers, explain expectations and requirements, and understand their readiness and challenges. This dialogue helps identify practical barriers and collaborative improvement opportunities.

Long-term improvement direction

1. Improve the proportion and quality of certification: Gradually shift from RSPO bookkeeping credit (B&C) to mass balance (MB) and segregation (SG) models to improve supply chain traceability and transparency. Set annual incremental certification proportion targets and publicly report progress.

2. Support smallholder farmers' transformation: Participate in or initiate capacity building projects for smallholder farmers to help them meet sustainable standards and obtain certification. This will not only expand the supply of sustainable raw materials, but also contribute to community development and supply chain resilience.

3. Explore innovative solutions: evaluate the feasibility of palm oil substitutes, such as the 59 non-food biodiesel plants studied in Hainan, China, or invest in technological innovations that improve the efficiency of palm oil utilization. In the long run, feedstock diversification can reduce supply chain risks.

4. Strengthen industry leadership: Play a leading role in the industry by sharing best practices, participating in standard setting, advocating policy reforms, etc. Systemic changes in sustainable palm oil require demonstration and promotion by pioneering companies.

5. Integrate the concept of circular economy: Explore the value-added utilization of palm oil by-products or waste oil recycling projects to improve resource utilization efficiency. For example, the technology of anaerobic fermentation of sludge to produce volatile fatty acids may provide an additional source of raw materials.

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