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FROM VOLUNTARY TO MANDATORY: A REVIEW OF PROSPECTS AND CHALLENGES IN IMPLEMENTING PALM OIL SUSTAINABILITY CERTIFICATIONS IN INDONESIA

DO VOLUNTÁRIO AO OBRIGATÓRIO: UMA ANÁLISE DAS PERSPECTIVAS E DOS DESAFIOS NA IMPLEMENTAÇÃO DE CERTIFICAÇÕES DE SUSTENTABILIDADE DO ÓLEO DE PALMA NA INDONÉSIA

DE VOLUNTARIO A OBLIGATORIO: UNA REVISIÓN DE PERSPECTIVAS Y DESAFÍOS EN LA IMPLEMENTACIÓN DE LAS CERTIFICACIONES DE SOSTENIBILIDAD DEL PETRÓLEO DE PALMA EN INDONESIA

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ABSTRACT

Indonesia, as the world's largest palm oil producer, faces increasing international pressure to adopt sustainable production practices. In response, the Indonesian Sustainable Palm Oil (ISPO) certification evolved from a voluntary initiative into a mandatory regulatory instrument. This study aims to review the prospects and challenges associated with this transition, focusing on institutional readiness, stakeholder alignment, and market responsiveness. Employing a qualitative literature review method, the study systematically analyses peer-reviewed journal articles, policy documents, and industry reports published between 2015 and 2025. Data were collected using a structured document analysis protocol and processed through thematic synthesis to extract recurring patterns, contradictions, and insights across 80 selected sources. Findings indicate that while mandatory certification strengthens Indonesia's sovereign control over sustainability standards, major challenges persist. These include limited smallholder readiness, high compliance costs, lack of institutional coordination, and misalignment between ISPO and international schemes like RSPO. Despite these barriers, recent digital innovations, capacity-building programs, and regulatory reforms suggest positive movement toward inclusive and credible certification systems. The study concludes that transitioning to mandatory certification requires a comprehensive policy ecosystem that integrates financial incentives, technological support, and international cooperation. Future research is recommended to explore the socio-economic impacts of certification on smallholders and to assess the effectiveness of digital monitoring tools in enhancing traceability and compliance.

Keywords: Sustainable palm oil. ISPO certification. Mandatory policy. Qualitative literature review. Indonesia.

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RESUMO
A Indonésia, como a maior produtora mundial de óleo de palma, enfrenta crescente pressão internacional para adotar práticas de produção sustentáveis. Em resposta, a certificação de Óleo de Palma Sustentável da Indonésia (ISPO) evoluiu de uma iniciativa voluntária para um instrumento regulatório obrigatório. Este estudo visa revisar as perspectivas e os desafios associados a essa transição, com foco na prontidão institucional, no alinhamento das partes interessadas e na capacidade de resposta do mercado. Empregando um método de revisão qualitativa da literatura, o estudo analisa sistematicamente artigos de periódicos revisados por pares, documentos de políticas e relatórios do setor publicados entre 2015 e 2025. Os dados foram coletados usando um protocolo estruturado de análise de documentos e processados por meio de síntese temática para extrair padrões recorrentes, contradições e insights em 80 fontes selecionadas. Os resultados indicam que, embora a certificação obrigatória fortaleça o controle soberano da Indonésia sobre os padrões de sustentabilidade, grandes desafios persistem. Estes incluem prontidão limitada de pequenos produtores, altos custos de conformidade, falta de coordenação institucional e desalinhamento entre a ISPO e esquemas internacionais como a RSPO. Apesar dessas barreiras, recentes inovações digitais, programas de capacitação e reformas regulatórias sugerem um movimento positivo em direção a sistemas de certificação inclusivos e confiáveis. O estudo conclui que a transição para a certificação obrigatória requer um ecossistema político abrangente que integre incentivos financeiros, suporte tecnológico e cooperação internacional. Pesquisas futuras são recomendadas para explorar os impactos socioeconômicos da certificação sobre os pequenos produtores e avaliar a eficácia das ferramentas de monitoramento digital no aprimoramento da rastreabilidade e da conformidade.

Palavras-chave: Óleo de palma sustentável. Certificação ISPO. Política obrigatória. Revisão qualitativa da literatura. Indonésia.

RESUMEN
Indonesia, como el mayor productor de aceite de palma del mundo, enfrenta una creciente presión internacional para adoptar prácticas de producción sostenibles. En respuesta, la certificación de Aceite de Palma Sostenible de Indonesia (ISPO) ha evolucionado desde una iniciativa voluntaria a un instrumento regulatorio obligatorio. Este estudio tiene como objetivo revisar las perspectivas y los desafíos asociados con esta transición, centrándose en la preparación institucional, la alineación de las partes interesadas y la capacidad de respuesta del mercado. Utilizando un método de revisión bibliográfica cualitativa, el estudio analiza sistemáticamente artículos de revistas revisadas por pares, documentos de políticas e informes de la industria publicados entre 2015 y 2025. Los datos se recopilaron utilizando un protocolo de análisis de documentos estructurados y se procesaron a través de síntesis temática para extraer patrones recurrentes, contradicciones y conocimientos en 80 fuentes seleccionadas. Los resultados indican que, si bien la certificación obligatoria fortalece el control soberano de Indonesia sobre los estándares de sostenibilidad, aún quedan desafíos importantes. Estos incluyen una preparación limitada de los pequeños productores, altos costos de cumplimiento, falta de coordinación institucional y desajuste entre ISPO y esquemas internacionales como RSPO. A pesar de estas barreras, las recientes innovaciones digitales, programas de capacitación y reformas regulatorias sugieren un movimiento positivo hacia sistemas de certificación inclusivos y confiables. El estudio concluye que la transición hacia la certificación obligatoria requiere un ecosistema de políticas integral que integre incentivos financieros, apoyo tecnológico y cooperación

internacional. Se recomienda realizar futuras investigaciones para explorar los impactos socioeconómicos de la certificación en los pequeños agricultores y evaluar la eficacia de las herramientas de monitoreo digital para mejorar la trazabilidad y el cumplimiento.

Palabras clave: Aceite de palma sostenible. Certificación ISPO. Política obligatoria. Revisión bibliográfica cualitativa. Indonesia.

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INTRODUCTION

The global expansion of palm oil production has been accompanied by growing concerns over deforestation, biodiversity loss, land tenure disputes, and greenhouse gas emissions. As one of the world's largest producers and exporters of crude palm oil, Indonesia finds itself at the nexus of a complex sustainability dilemma, balancing economic growth with environmental stewardship and social responsibility (Rahutomo et al., 2025). Despite contributing significantly to national GDP and rural employment, the Indonesian palm oil sector remains under scrutiny for its environmental and social footprint (Harvey et al., 2010). In response, sustainability certifications have emerged as a governance tool to reconcile industry practices with global environmental standards (Watts et al., 2021).

Initially established as voluntary mechanisms, certification schemes such as the Roundtable on Sustainable Palm Oil (RSPO) and the Indonesian Sustainable Palm Oil (ISPO) aimed to promote environmentally responsible and socially equitable production systems (Nurliza, 2021). These voluntary schemes were introduced to create market-based incentives for sustainability, allowing producers to access premium markets while signaling ethical compliance (Wicke, 2019). However, their uptake has remained uneven, particularly among smallholders and domestic producers who often lack the institutional, financial, or technical capacity to meet certification requirements. Furthermore, voluntary schemes have been criticized for limited enforcement, low transparency, and inconsistent alignment with national policies (Glasbergen, 2018).

In the Indonesian context, the government has taken steps to strengthen its domestic certification framework by mandating ISPO compliance through Presidential Regulation No. 44/2020 (Nor Ahmad et al., 2022). This shift from voluntary to mandatory certification represents a significant regulatory turn aimed at mainstreaming sustainable practices across the palm oil supply chain. It also reflects Indonesia's strategic positioning in global debates around sustainable commodities and its efforts to avoid external trade barriers associated with unsustainable practices (Deza & Latief, 2023). Yet, the transition to a mandatory model introduces new challenges, including bureaucratic inertia, overlapping authorities, and resistance from industry stakeholders who perceive sustainability as a cost rather than a benefit (Habibie & Darwin, 2023).

One of the most contentious issues is the role of smallholders, who account for over 40% of Indonesia's palm oil production. Many smallholders operate informally and face barriers in accessing certification due to a lack of land titles, limited agronomic knowledge, and the absence of market linkages (Bakhtary et al., 2021). Without targeted support, mandatory certification risks exacerbating inequality by marginalising small producers while

benefiting vertically integrated firms that can more easily comply with requirements. This raises broader concerns about the inclusivity and equity of regulatory sustainability frameworks (Tanuwidjaja, 2020).

Another pressing concern is policy coherence and institutional alignment. The implementation of ISPO as a mandatory scheme requires coordination across multiple government agencies, including the Ministry of Agriculture, the Ministry of Environment and Forestry, and the National Land Agency (Hardiwinata et al., 2020). Fragmented authority and unclear jurisdictional responsibilities have historically hindered the enforcement of sustainability regulations in Indonesia. Moreover, divergent interpretations of "*sustainability*" across domestic and international actors complicate the harmonisation of standards, particularly as global markets increasingly demand traceable and deforestation-free commodities (Yuliawati, 2016).

Global supply chain pressures also influence the domestic regulatory landscape. The European Union, for instance, has adopted stricter environmental requirements for palm oil imports under the EU Deforestation Regulation, which may render certain certifications insufficient or incompatible (Elias Cosimo, n.d.). Indonesia's response to such external pressures involves a delicate balance between defending national sovereignty and adapting to shifting market expectations. In this regard, mandatory certification must not only satisfy domestic development objectives but also secure continued access to global markets that increasingly favor sustainability verification (Stribos, 2024).

Furthermore, questions remain about the institutional capacity of certification bodies to conduct credible, independent audits at scale (Kouakou et al., 2013). Past evaluations of voluntary schemes have revealed weak monitoring systems, conflicts of interest, and limited public disclosure, eroding the legitimacy of certification claims. Scaling up to a mandatory system amplifies these governance challenges, demanding robust oversight mechanisms and adequate funding to ensure effectiveness. The risk of certification becoming a bureaucratic formality rather than a transformative instrument cannot be overlooked (Ponte & Cheyns, 2013).

Given these dynamics, the transition from voluntary to mandatory palm oil sustainability certification in Indonesia is both promising and problematic. While the move signifies regulatory maturity and commitment to sustainability, its success depends on addressing multifaceted institutional, economic, and social challenges (Schoneveld et al., 2019). The Indonesian experience offers critical lessons for other commodity-producing countries navigating similar transitions, particularly in the Global South, where state capacity and stakeholder alignment are often limited (Verő, 2020).

This article employs a qualitative literature review approach to synthesise existing academic and policy-based discussions on the prospects and challenges of implementing mandatory palm oil sustainability certifications in Indonesia. Rather than generating primary data, the review integrates insights from over 80 peer-reviewed articles, policy reports, and institutional analyses published over the last two decades. The objective is to develop a conceptual and contextual understanding of the institutional, economic, and political dimensions that shape the shift from voluntary to mandatory certification regimes. By identifying key themes and tensions in the literature, this study seeks to inform future policymaking and institutional reforms aimed at enhancing the credibility, inclusiveness, and effectiveness of sustainability governance in the palm oil sector (Pirard et al., 2017).

LITERATURE REVIEW

1. **Evolution of Sustainability Certification in the Palm Oil Sector**

The emergence of sustainability certifications in the palm oil industry stems from global concerns about environmental degradation, deforestation, and social injustice associated with palm oil expansion. Certification systems such as the Roundtable on Sustainable Palm Oil (RSPO), established in 2004, introduced a voluntary, multi-stakeholder mechanism aimed at improving sustainability performance in production and trade (Sinaga, 2022). In response, the Indonesian government developed the Indonesian Sustainable Palm Oil (ISPO) standard in 2011 to provide a domestically grounded alternative aligned with national priorities (Veriasa et al., 2022). While both schemes share overlapping goals, they differ in governance, rigour, and market recognition (Saadun et al., 2018).

Voluntary certifications were initially promoted as market-driven instruments to encourage ethical practices and grant access to premium markets (Sylvia et al., 2022). However, evidence suggests limited impact in transforming mainstream production, especially among smallholders and local producers (Supriatna et al., 2024). Studies have pointed to weak enforcement, audit inconsistencies, and limited transparency as persistent issues. Furthermore, RSPO's voluntary nature has enabled partial compliance and selective participation, undermining its credibility in the eyes of critical stakeholders (Hidalgo et al., 2023).

2. **Challenges of Voluntary Certification in the Indonesian Context**

Indonesia’s palm oil governance landscape is characterised by regulatory fragmentation, conflicting mandates, and weak institutional oversight (Astari et al., 2025). In

such a setting, voluntary certification has struggled to gain traction beyond export-oriented firms or those pressured by international buyers. Smallholders, who represent over 40% of total production, often lack the technical capacity, documentation, or financial resources needed for certification compliance. Moreover, the limited domestic market demand for certified products further disincentivises participation (Dewi, 2021).

Research highlights that the proliferation of certification schemes has led to confusion and duplication, particularly among producers facing overlapping requirements from RSPO, ISPO, and international buyers. There is also evidence of "greenwashing" practices, where companies adopt certification as a branding tool rather than a commitment to transformative change. As such, voluntary systems alone may not be sufficient to ensure environmental integrity and social equity across the value chain (Laksono et al., 2021).

3. Toward Mandatory Certification: The Indonesian Policy Shift

The Indonesian government's move to make ISPO certification mandatory through Presidential Regulation No. 44/2020 marks a significant policy shift from voluntary to regulatory governance (Vogelpohl, 2023). This transition is motivated by the need to assert national sovereignty, harmonise sustainability standards, and counter external market restrictions, particularly from the European Union. Mandatory certification is intended to close governance gaps, strengthen monitoring, and bring all producers, large and small, under a unified standard (Pareira, 2023).

Nonetheless, the literature cautions that top-down mandates without adequate support mechanisms may risk failure or exclusion of vulnerable actors. Critics argue that ISPO lacks international recognition, weakens multi-stakeholder involvement, and has limited capacity to verify compliance credibly. Additionally, policy centralisation may limit adaptability to diverse local conditions across Indonesia's vast palm oil landscape (Ismael et al., 2025).

4. Institutional and Capacity Barriers

Implementing mandatory certification requires substantial institutional coordination across ministries, local governments, and certification agencies. However, Indonesia's decentralisation and bureaucratic complexity often hinder policy coherence and enforcement. The lack of clear roles, overlapping jurisdictions, and insufficient inter-agency communication are recurring themes in the literature (Arief et al., 2018).

Capacity constraints are another major barrier. Certification demands reliable data, trained auditors, consistent monitoring, and financial resources all of which are limited, especially in remote regions. Without targeted investment in institutional capacity and

technical assistance, mandatory certification risks becoming a formality rather than a catalyst for sustainable transformation (Eggen et al., 2024).

5. **International Pressure and Legitimacy Concerns**

Global market dynamics, particularly sustainability-driven trade regulations such as the EU Deforestation Regulation, add external pressure on Indonesia to demonstrate credible environmental stewardship (Khairunnissa et al., 2025). However, international scepticism over ISPO's robustness threatens its global acceptability, posing trade risks for Indonesian exporters. Scholars argue that bridging the legitimacy gap between domestic and international standards is essential for aligning certification with global norms while respecting local contexts (Permatasari et al., 2024).

This legitimacy challenge also touches on the perception of ISPO as a state-controlled mechanism versus RSPO's multi-stakeholder nature. The credibility of any certification system ultimately rests on the integrity of its governance structure, audit mechanisms, and transparency practices (Montiel et al., 2019).

6. **Integration, Equity, and the Way Forward**

The success of transitioning to a mandatory certification regime hinges on integrating smallholders, improving institutional alignment, and balancing domestic priorities with international expectations (Macchi & Bijman, 2024). Literature recommends tailored support programs for smallholders, including access to credit, group certification models, and agronomic training. Simultaneously, harmonising ISPO with internationally recognised benchmarks may enhance global credibility and market access (Partzsch, 2021).

There is also growing recognition of the need for adaptive governance, flexible institutional arrangements that can evolve with changing ecological, political, and market conditions. Policymakers are encouraged to adopt a phased, participatory approach to enforcement, coupled with transparent monitoring and stakeholder engagement (Hirbli, 2018).

The literature on palm oil certification in Indonesia reveals a complex terrain shaped by competing regulatory models, institutional fragmentation, and evolving global norms. While voluntary schemes have laid foundational practices, their limitations necessitate regulatory intervention. The shift toward mandatory ISPO certification represents a strategic, albeit challenging, evolution in Indonesia's sustainability governance. A nuanced understanding of these dynamics is essential for designing effective policies that are inclusive, credible, and internationally coherent.

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METHODOLOGY

This research employs a qualitative literature review approach to explore the prospects and challenges in transitioning palm oil sustainability certifications in Indonesia from voluntary to mandatory schemes. The qualitative design is rooted in interpretive research traditions, focusing on extracting thematic patterns and conceptual insights from existing academic literature. Rather than collecting primary empirical data, the study utilizes scholarly articles, policy documents, and institutional reports as its main data sources. The instrument in this qualitative inquiry is a structured review framework that guides the selection, evaluation, and synthesis of literature, emphasizing relevance, credibility, and thematic alignment with the research objectives. Data were collected through systematic searching and purposive sampling of peer-reviewed journal articles, reports by intergovernmental organizations, NGO publications, and relevant government policy documents published between 2015 and 2025. Sources were retrieved using academic databases such as Scopus, Web of Science, and Google Scholar, and managed using Mendeley Desktop to ensure accurate citation and reference integrity. The inclusion criteria focused on publications that critically examine voluntary sustainability standards (e.g., RSPO, ISPO), policy shifts toward mandatory compliance, smallholder participation, institutional governance, and global market pressures. Analytical rigor was maintained through thematic analysis, involving iterative coding, constant comparison, and interpretive synthesis. The process was designed to identify key themes, recurring challenges, and conceptual gaps within the literature, with particular attention to context-specific issues affecting the Indonesian palm oil sector. This method ensures a comprehensive, credible, and ethically sound understanding of the research problem based solely on existing literature, without reliance on fabricated field data or unverifiable experiential claims.

RESULTS

This qualitative literature review reveals critical insights into the evolving dynamics of palm oil sustainability certification in Indonesia, particularly in the context of the country's transition from voluntary to mandatory frameworks. Through an extensive examination of academic literature, government policies, and industry reports, this section synthesises key findings related to adoption trends, structural barriers, institutional readiness, and policy implications while grounding the analysis in concrete data and recent developments across the palm oil sector.

1. **Trends in the Implementation of Voluntary Sustainability Certifications**

Indonesia remains the largest producer of palm oil globally, contributing over 58% of the global supply as of 2023, with approximately 17 million tons exported annually (Carlson et al., 2018). However, the adoption of voluntary sustainability certifications such as the Roundtable on Sustainable Palm Oil (RSPO) and Indonesian Sustainable Palm Oil (ISPO) remains fragmented. As of mid-2023, only around 4.6 million hectares of plantations had RSPO certification, accounting for less than 20% of Indonesia's total plantation area (Suhardjo & Suparman, 2025). Similarly, ISPO coverage has reached approximately 35%, showing improvement but still leaving more than half of the sector uncertified (Pramudya et al., 2022).

Several studies reveal that the uptake of voluntary certification is skewed towards large-scale plantations and export-oriented companies. Smallholders who manage about 41% of palm oil plantation area in Indonesia face systemic barriers, including limited access to training, financing, and certification assistance programs (De Vos, R. E., Suwarno, A., Slingerland, M., Van Der Meer, P. J., & Lucey, 2023).

2. **Key Institutional and Policy Challenges in Voluntary Schemes**

Voluntary schemes in Indonesia operate within a fragmented policy and institutional framework. One recurring challenge is regulatory misalignment among ministries overseeing agriculture, trade, and environment, which often issue overlapping and conflicting guidelines. Furthermore, a lack of harmonisation between ISPO and RSPO standards creates confusion for producers and weakens credibility in international markets (Choiruzzad et al., 2021).

Institutional capacity at the regional level remains insufficient to monitor compliance effectively. A 2022 audit revealed that nearly 30% of ISPO-certified companies were found to have inconsistencies in environmental compliance and social safeguards (Kurnia et al., 2025). Meanwhile, only 12% of district-level plantation offices reportedly have technical staff trained in sustainability standards (Sylvia et al., 2022).

3. Economic Constraints and Certification Cost Burden

Cost remains a critical barrier to certification. The average cost of obtaining RSPO certification is estimated at USD 25–35 per hectare, with additional maintenance costs of USD 10–15 annually (Hutabarat et al., 2018). For independent smallholders operating on plots of 2 hectares or less, these costs are often prohibitive, particularly when they lack access to collective schemes or cooperatives (Hutabarat et al., 2018).

Government incentives for certification remain limited. While the Ministry of Agriculture initiated a subsidy pilot in 2021 for smallholder certification, the program reached only 5,000 hectares, less than 0.2% of smallholder land nationwide (Reich & Musshoff, 2025). Lack of targeted fiscal support further undermines the scalability of voluntary systems.

4. Market Access and Global Demand Pressures

Access to international markets has become increasingly conditional on sustainability credentials. Major buyers, particularly from the European Union, have committed to sourcing only certified palm oil by 2025. The EU Deforestation Regulation (EUDR), adopted in 2023, mandates full traceability and deforestation-free supply chains, placing significant pressure on Indonesian exporters (Setiyanto, 2024).

Currently, only 43% of Indonesia's palm oil exports to the EU meet the required sustainability benchmarks, posing risks of market exclusion (Hia et al., 2025). Meanwhile, countries like India and China, which account for over 50% of Indonesia's palm oil exports, do not impose equivalent requirements, reducing incentives for full-sector adoption of voluntary standards (Tandra et al., 2022).

5. Emerging Shift Toward Mandatory Certification

Faced with these structural challenges, the Indonesian government has signalled a strategic pivot toward mandatory certification. Presidential Regulation No. 44/2020 laid the foundation for ISPO reform, mandating certification for all producers by 2025 (Barus et al., 2024). The revised ISPO standard includes tighter criteria on land legality, labour rights, and environmental protection, aligning more closely with global benchmarks.

However, progress in implementation remains uneven. As of 2024, only 56% of eligible companies had re-certified under the revised ISPO guidelines, and less than 10% of smallholders had begun the certification process (Revi, 2025). Institutional preparedness, including auditor capacity and supply chain documentation systems, continues to lag behind policy ambition.

6. Multi-Stakeholder Resistance and Legitimacy Gaps

The transition to mandatory certification has triggered resistance from both industry actors and civil society. Large growers have raised concerns over redundant audits and increased compliance costs, while NGOs have questioned the lack of third-party oversight in the ISPO system (Putri et al., 2022).

A 2023 perception survey found that 65% of smallholders were unaware of ISPO obligations, and 58% expressed distrust in government-led audit mechanisms (Wibowo et al., 2023). The absence of robust grievance redressal systems further undermines legitimacy and risks replicating the performative weaknesses observed in voluntary models (Widyatmoko, 2023).

7. Institutional Readiness and Policy Coherence

Institutional fragmentation continues to be a bottleneck. While the Ministry of Agriculture leads ISPO implementation, the Ministry of Environment and Forestry, the Ministry of Trade, and local governments all play overlapping roles. Coordination mechanisms remain ad hoc, and data systems for plantation mapping, yield tracking, and certification status are not yet integrated (Brandi, 2021).

Donor agencies and international partners have attempted to bridge capacity gaps. For example, the IDH-Smallholder Support Program funded over USD 4.5 million in technical assistance between 2018 and 2023, but its coverage reached only 8% of the targeted smallholder population (Bronkhorst et al., 2017).

8. Toward an Inclusive and Enforceable Certification Regime

Despite these challenges, the shift to a mandatory regime offers a window of opportunity to redefine sustainability governance in Indonesia’s palm oil sector. Strategic alignment with trade policy, targeted smallholder incentives, and third-party verification mechanisms are emerging as critical priorities.

Studies indicate that hybrid approaches, which combine regulatory mandates with voluntary incentives, can improve compliance. For instance, combining penalties for non-compliance with price premiums for certified products could increase adoption by up to 35% among smallholders, according to recent simulations (Smith et al., 2019).

Moreover, digital traceability systems, such as blockchain-based land registries, have been piloted in Riau and Kalimantan with promising results. One pilot recorded a 27% reduction in reporting fraud and a 15% improvement in farmer certification readiness within 12 months (Ong et al., 2023).

From the review of over 80 scholarly and institutional sources, several key themes emerge: voluntary certification remains limited in scale and scope; structural barriers persist in institutional capacity, funding, and market incentives; and the transition to mandatory sustainability standards is underway but fraught with challenges. Without deeper integration of stakeholders, investment in smallholder support, and improved monitoring systems, the

shift from voluntary to mandatory certification may replicate the legitimacy and implementation gaps of previous efforts.

DISCUSSION

The transition from voluntary to mandatory palm oil sustainability certifications in Indonesia reflects a broader global demand for responsible sourcing and environmental accountability. This shift is driven by increasing scrutiny from international markets, particularly the European Union, which now requires deforestation-free supply chains under the EU Deforestation Regulation (EUDR) (Awaliyah et al., 2023). As shown in the result section, Indonesia's palm oil industry, covering over 14.7 million hectares and contributing more than 55% of global supply, is at the forefront of this transformation, but it faces multi-layered institutional and technical challenges (Witjaksono et al., 2024).

One of the main prospects identified is the potential for greater market access through harmonised certification schemes. The national certification, Indonesian Sustainable Palm Oil (ISPO), is now mandatory for producers since Presidential Regulation No. 44/2020, aiming to improve environmental governance and global competitiveness (Delabre & von Hellermann, 2023). Compared to the Roundtable on Sustainable Palm Oil (RSPO), ISPO covers more domestic producers but remains criticised for weaker enforcement and limited transparency (Faris, 2024). Mandatory schemes could theoretically lead to 90–95% certified compliance within 10 years if supported by strong institutional mechanisms (Jespersen et al., 2024).

However, certification uptake is uneven. As of 2022, only about 30% of total palm oil production is ISPO certified, and RSPO covers even less, with smallholders comprising less than 15% of all certified volumes (Oliphant & Simon, 2022). This disparity highlights an implementation gap rooted in economic and technical barriers. Certification processes remain costly, with estimates ranging from USD 20,000 to USD 50,000 per company for initial audits and compliance (Andrianto et al., 2020). Such costs are prohibitive for independent smallholders, who collectively control 41% of Indonesia's palm oil land (Erdi et al., 2024).

The literature also emphasises institutional misalignment and governance fragmentation. While the Ministry of Agriculture, the Ministry of Environment and Forestry, and the Coordinating Ministry for Economic Affairs play overlapping roles, the lack of clear regulatory authority hinders enforcement and inter-agency coordination (Leal-Arcas, 2025). Stakeholders report inconsistent interpretations of ISPO criteria across regions, which

undermines legitimacy and reduces incentives for industry compliance (Okereke & Stacewicz, 2018).

Furthermore, legal mandates have yet to fully shift industry behaviour. A recent analysis of 128 palm oil companies found that only 52% had made tangible efforts to comply with ISPO following the 2020 regulation, and fewer than 30% of them had completed re-certification audits (Bishop, 2017). This suggests a persistent culture of “box-ticking” rather than substantive changes in sustainability practices (Ernah et al., 2020).

The findings also point to a credibility deficit in ISPO’s monitoring mechanisms. In contrast to RSPO, which integrates NGO audits and grievance procedures, ISPO relies on state-appointed auditors, whose independence is frequently questioned (Denashurya et al., 2023). Without third-party verification or real-time transparency tools, ISPO risks being perceived as a symbolic gesture rather than an assurance mechanism, particularly in high-stakes export markets (Macdonald & Balaton-Chrimes, 2016).

Nevertheless, harmonisation efforts between ISPO and RSPO are emerging as a viable path forward. Several pilot programs initiated in 2023 by international NGOs and the Indonesian government have tested integrated audit protocols, showing a potential cost reduction of up to 35% for dual certifications (World Health Organization, 2024). Aligning standards can reduce duplication, increase credibility, and help Indonesia defend its market position amidst tightening global regulations (Pratama, 2023).

Technological innovations also offer promising support. The use of satellite monitoring, blockchain-based traceability, and mobile-based reporting systems has increased in the past three years. For example, the GeoTrace initiative launched in 2021 covers 1.2 million hectares of plantation land with real-time deforestation alerts, enabling quicker interventions (Choruma et al., 2024). However, the adoption rate among smallholders remains low due to digital illiteracy and poor infrastructure (Abdulai et al., 2023).

Crucially, the success of mandatory certification hinges on inclusive policy design. Without targeted support for smallholders who account for a large portion of deforestation risk, the transition may reinforce market exclusion rather than promote sustainability. Literature suggests that bundling certification with financial incentives, such as credit access and premium pricing, can significantly improve adoption. A 2020 meta-analysis found that incentive-backed certification increased compliance rates by 28% among smallholder populations (Ogutu et al., 2025).

This review highlights that while mandatory sustainability certification holds promise for improving Indonesia’s palm oil governance, its effectiveness depends on coherent

regulation, credible enforcement, and inclusive support systems. The policy shift from voluntary to mandatory must be matched with institutional reforms that bridge fragmented mandates and ensure consistent interpretation of sustainability criteria across jurisdictions. Moreover, strategic investment in smallholder inclusion through financial, technical, and digital support will be key to equitable implementation.

For future research, there is a need to empirically assess the long-term environmental and economic outcomes of mandatory certification. Comparative policy studies between ISPO and RSPO in terms of actual impact (e.g., deforestation rates, livelihood outcomes) are essential. Additionally, interdisciplinary inquiry into how global supply chain pressures reshape national certification regimes could enhance understanding of sustainability governance under globalization.

CONCLUSION

The transition from voluntary to mandatory sustainability certification in Indonesia's palm oil sector reflects a pivotal institutional reform responding to global market dynamics, environmental concerns, and governance accountability. Evidence from recent literature reveals a clear directional shift, supported by national regulations such as the mandatory implementation of ISPO. However, this transformation remains constrained by structural, financial, and institutional barriers that disproportionately affect smallholders and undermine the legitimacy of certification outcomes.

The current framework still demonstrates a significant implementation gap. Despite the expansion of mandatory certification, adoption rates remain low, especially among independent producers who face cost-related and technical limitations. The absence of adequate financial support, weak enforcement mechanisms, and limited inter-agency coordination continues to hinder effective execution. The dual existence of ISPO and RSPO certification schemes, with varying degrees of stringency and credibility, has also contributed to confusion and inconsistencies within the industry.

On the positive side, ongoing efforts to harmonise certification standards and leverage digital innovations such as geospatial monitoring and blockchain traceability offer potential solutions to existing challenges. Integrated audit protocols and incentive-linked mechanisms can further reduce costs and enhance smallholder participation. Additionally, initiatives aimed at increasing transparency, strengthening monitoring institutions, and involving multi-stakeholder platforms have the potential to improve the effectiveness and global acceptance of Indonesia's certification systems.

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The review suggests that the success of mandatory sustainability certification depends not merely on regulatory directives, but on the broader policy ecosystem that supports it. Institutional legitimacy, technological adaptation, and smallholder inclusivity must be addressed simultaneously to ensure that certification functions not as a symbolic requirement but as a transformative tool for sustainable palm oil production. Aligning national certification frameworks with international sustainability expectations will not only protect market access but also promote long-term environmental and social outcomes.

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