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Article

Impacts of the European Union deforestation regulation on Vietnam's coffee supply chains

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Abstract: In June 2023, the European Union (EU) enacted the Regulation on Deforestation-Free Products (EUDR), which requires agricultural products to enter and leave its territory free from deforestation. The regulations apply to seven commodities: cattle, cocoa, coffee, oil palm, rubber, soya, wood, and their derivate products grown or raised on land subject to deforestation or forest degradation will be banned from entering the EU market. EUDR will have a significant impact on Vietnam's Exports of Agricultural Products. Coffee, rubber, wood, and wood products are the main industries in Vietnam affected by this regulation, as the country exports a substantial portion of these products to EU markets. This article examines the impacts of the European Union Deforestation Regulation on Vietnam's coffee supply chains, discusses possible unintended effects on coffee farmers and farming households, and explores strategies to mitigate these negative impacts while highlighting specific challenges that may arise. The results of this study contribute to a better understanding and management of Vietnam's agricultural exports, particularly in the coffee sector. Additionally, the article gives some recommendations for improving Vietnam's laws and policies on deforestation-free products.

Keywords: sustainability; deforestation; due diligence system; coffee; traceability; Vietnam

1. Introduction

Deforestation and forest degradation are important drivers of climate change and biodiversity loss and threaten rural livelihoods (FAO, 2022). Deforestation raises climate change issues (Gatti et al., 2021), threatens biodiversity conservation, and promotes the spread of infectious diseases that harm human health and the economy (FAO, 2022; Santos and Almeida, 2018; Tacconi, 2007) deforestation can also pose a development problem through the loss of resources for the government if criminal activities such as illegal deforestation are present (World Bank, 2019).

The Food and Agriculture Organization of the United Nations (FAO) estimates that 420 million hectares of forest—about 10% of the world's remaining forests, equaling an area larger than the European Union—have been lost worldwide between 1990 and 2020 (FAO, 2020b). Agricultural expansion and trade in agricultural commodities and forestry products are major drivers of global forest loss (FAO and UNEP, 2020). The European Union is notably responsible for 16% of deforestation associated with international trade in 2017, making it the second-largest importer of goods linked to deforestation (Worldwide Fund for Nature [WWF], 2021).

In June 2023, the European Union enacted the EU Deforestation-Free Regulation (EUDR), which requires agricultural products to enter and leave its territory free from deforestation. The regulations apply to seven commodities: cattle, cocoa, coffee, oil palm, rubber, soya, wood, and their derivate products grown or raised on land subject

to deforestation or forest degradation will be banned from entering the EU market (European Commission, 2023a). The EUDR requires companies to ensure that relevant commodities and relevant products shall not be placed or made available on the market or exported unless all the following conditions are fulfilled: (a) they are deforestation-free; (b) they have been produced in accordance with the relevant legislation of the country of production; and (c) they are covered by a due diligence statement. This regulation marks a significant legislative step in addressing global deforestation by enforcing stringent import requirements on these agricultural commodities, including coffee. It also marks an important milestone in addressing deforestation associated with the EU (European Commission, 2023b).

Over the past 30 years, Vietnam has emerged as one of the world's largest coffee producers, with export turnover steadily increasing (International Coffee Organization [ICO], 2024). Coffee production and exports play a crucial role in the national economy, accounting for a significant share of the country's agricultural exports. The industry supports millions of smallholder farmers, particularly in the Central Highlands, and Vietnam is now the second-largest coffee exporter globally (United States Department of Agriculture Foreign Agricultural Service, 2024a). The country's coffee sector is deeply tied to the livelihoods of farmers, the rural economy, and global trade networks, highlighting the growing importance of regulating sustainable production practices. However, Vietnam is facing significant changes in its coffee supply chain due to the stringent requirements of the European Union deforestation regulation.

Over the past two decades, global demand for coffee has steadily increased, leading to consistent growth in production and exports. According to the International Coffee Organization (ICO, 2023), worldwide coffee consumption exceeded 168.5 million bags during the 2021–2022 period (Panhuysen and de Vries, 2023).

The EU is currently Vietnam's largest trading partner and its third-largest export market, with an average export growth rate of 7.5%, accounting for 13.6% of Vietnam's total exports between 2015 and 2021 (Kylie Nguyen, 2022). Additionally, Europe is the largest coffee consumer market, accounting for 2.54 million tons of coffee in 2022, or 24% of total global coffee consumption, followed by the US at 16%, equivalent to 1.66 million tons (Panhuysen and de Vries, 2023). As a major market for Vietnam's coffee industry, the European Union (EU) has caught the attention of Vietnamese coffee farmers, who are closely monitoring the new EU Deforestation Regulation (EUDR) which comes into force later this year (USDA FAS, 2024b).

This article examines the impacts of the EUDR on Vietnam's coffee supply chains, discusses potential unintended effects on coffee farmers and households, and explores strategies to mitigate these negative impacts while addressing specific challenges. The findings of this study contribute to a better understanding and management of Vietnam's agricultural exports, particularly in the coffee sector.

2. Literature review

The literature on the impacts of the European Union's deforestation regulation on agricultural products is relatively nascent but growing steadily. For example, in a descriptive study, Zhunusova et al. (2022) highlight that the proposed EU regulation

on deforestation-free supply chains imposes significant challenges for smallholders, indigenous peoples, and local communities in producer countries outside the EU. While the regulation aims to curb deforestation globally, it may inadvertently push smallholder farmers, who often lack the economic resources and knowledge needed to meet stringent traceability requirements, out of the supply chain. The study also suggests several solutions to mitigate the negative impacts of the EUDR on vulnerable groups in non-EU producer countries, such as smallholders, indigenous peoples, and local communities.

Dang (2024) examined the potential unintended effects of the EUDR on Vietnam's agricultural products, particularly coffee, rubber, and wood products, emphasizing both the opportunities and challenges posed by the regulation. The study also proposed policy recommendations to help the government mitigate the negative effects of EUDR on vulnerable groups in Vietnam, thereby promoting poverty alleviation and sustainable development.

Additionally, Dao et al. (2023) analyze the extensive effects of climate change on Vietnam's agricultural sector from a macroeconomic viewpoint. The research highlights that climate change presents significant challenges, particularly reducing crop yields, threatening food security, and destabilizing farmers' livelihoods. The authors emphasize that smallholder farmers, who are disproportionately affected by climate variability, often lack the resources necessary for effective adaptation. Moreover, the study calls for comprehensive policy interventions and robust support systems to mitigate these challenges and promote sustainable agricultural practices capable of withstanding the adverse effects of climate change.

Furthermore, Cesar de Oliveira et al. (2024) examine the implications of the European Union Deforestation Regulation (EUDR) and the United Kingdom's deforestation-free supply chain legislation on Brazil's commodity sectors, including cattle, cocoa, coffee, palm oil, soybean, and timber. The study highlights the challenges posed by EUDR, particularly regarding compliance readiness, given Brazil's significant deforestation linked to agricultural expansion. Through the construction of a 'Compliance Likelihood Index,' the authors identify coffee as the sector most likely to comply with the EUDR, while the cattle sector faces substantial challenges due to its high deforestation footprint. The paper emphasizes the need for greater collaboration between Brazil and the EU/UK to align regulations and support Brazilian stakeholders, especially smallholders, in meeting deforestation-free requirements.

Moreover, Pham et al. (2022) explore the preferences of Vietnamese coffee farmers for sustainable agricultural practices (SAPs) through two discrete choice experiments (DCEs). The findings reveal that farmers prioritize SAPs that offer higher profits, reduce the risk of crop failure, and provide environmental benefits. In contrast, the increased daily effort and time required for adopting these practices are of lesser concern. Notably, farmers are willing to sacrifice some profits in exchange for greater environmental gains. The study highlights the need for policies that enhance profitability, minimize risks, and promote environmental sustainability, while also providing support to reduce the time and labor burden associated with adoption.

Purnomo et al. (2023) explore the complexities of zero-deforestation commitments within the context of Southeast Asia, particularly in Indonesia, and

emphasize the challenges associated with implementing such commitments in regions where agricultural expansion drives deforestation. The authors highlight that while both public and private sector initiatives have been introduced to mitigate deforestation, their effectiveness varies significantly due to the socio-economic and political intricacies inherent in these regions. In their analysis, Purnomo et al. (2023) also discuss the limitations of certification schemes such as the Roundtable on Sustainable Palm Oil (RSPO), which, despite being designed to promote sustainable practices, face implementation challenges that reduce their overall impact. The literature suggests that these certification schemes often struggle with issues related to enforcement, market acceptance, and leakage-where deforestation activities are merely displaced to other areas rather than eliminated.

In summary, the European Union Deforestation Regulation (EUDR) presents both challenges and opportunities for countries involved in exporting agricultural products to the EU. While the regulation aims to curb global deforestation, it also imposes significant compliance burdens, particularly on smallholder farmers and developing countries. However, current studies and reports lack a comprehensive analysis of the impacts of the EUDR on coffee supply chains in Vietnam.

3. Methodology

This article analyzes the impacts of the European Union Deforestation Regulation on Vietnam's Coffee Supply Chains. The research utilizes qualitative data collected through desk research and document analysis, including publicly available information from scientific publications, books, and other relevant documents related to the EUDR. The insights provided in this article may prove valuable for policymakers, coffee farmers, smallholders, local communities, and the government in mitigating the negative effects of the EUDR on vulnerable groups in Vietnam, thereby fostering poverty alleviation and sustainable development. The main issues addressed include (i) the current state of coffee supply chains in Vietnam; (ii) the potential impacts of the EUDR on these supply chains; (iii) Vietnam's contribution to tackling global deforestation; and (iv) recommendations for improving Vietnam's laws and policies on deforestation-free products.

4. Results and discussion

4.1. The current state of coffee supply chains in Vietnam

Vietnam is the world's second-largest coffee producer, trailing only Brazil (ICO, 2024). Coffee production and exports play a key role in the national economy, accounting for a significant share of the country's agricultural exports. According to the General Department of Customs, in 2023, coffee exports reached over 1.6 million tons (approximately 27 million bags), a decrease of 8.7% compared to 2022, but the value increased by 4.6% to a record high of over 4.24 billion USD. In December 2023 alone, Vietnam's coffee exports totaled 207.6 thousand tons, worth 599.4 million USD, representing a 74% increase in quantity and a 68% increase in value compared to November 2023, and a 5.4% increase in quantity and a 40.8% increase in value compared to the same period in 2022 (AGROINFO, n.d.).

Meanwhile, according to the United States Department of Agriculture (USDA) forecast for 2024/25, Vietnam's coffee production is expected to remain nearly unchanged at 29.0 million bags, with over 95 percent of total output remaining as Robusta. The rainy season was slightly delayed and above-average temperatures were recorded in many areas, adversely affecting yields. Similar conditions lowered yields and output in the previous 2 harvests. Bean exports are forecast to drop nearly 500,000 bags to 24.4 million due to reduced total supply and rising domestic consumption (USDA FAS, 2024a).

Vietnam's leading coffee export markets in 2023 remained the EU, Japan, the US, Russia, and others. Among these, the EU continued to be the largest export market, with a volume of 600,548 tons and a value of nearly 1.5 billion USD, accounting for 37% of Vietnam's total coffee export volume and 35% of the total export value. However, compared to 2022, coffee exports to this market decreased by 12.8% in volume and 0.7% in value. Within the EU, coffee exports to Germany reached 196,090 tons, down 12.7%; to Italy, 142,191 tons, up 2.1%; while exports to Spain and Belgium fell by 20% and 50.5%, respectively. Exports to another major market, the US, also decreased by 4.1% in 2023, totaling 293 million USD. Additionally, exports to Russia, the Philippines, and other markets also declined. In contrast, growth was recorded in Japan (up 14.9%), Algeria (up 88.4%), South Korea (up 27.1%), and notably, Indonesia (up 122.4%) (AGROINFO, n.d.).

Vietnam has two key climate regions suitable for coffee cultivation: The Central Highlands and the northern provinces. The Central Highlands, with their fertile basalt soil, is ideal for Robusta coffee cultivation and serves as the primary coffee-producing region, accounting for 95.5% of the total coffee-growing area. Between 2018 and 2022, this region's coffee-growing area expanded at an average annual growth rate of 1.5%. The northern provinces, with elevations between 600 and 800 meters, are better suited for Arabica coffee. The Midlands and Northern Mountainous region rank second, with an average coffee-growing area of 21.07 thousand hectares during 2018–2022, accounting for 3% of the total, and a 0.4% annual growth rate during this period (AGROINFO, n.d.; Dang, 2024).

According to data from MARD, by the end of 2023, Vietnam's total coffee cultivation area was approximately 710,000 hectares. Of this, 32,000 hectares are managed by state-owned corporations, while the remaining 668,000 hectares are owned by farmer households and smallholders, with each household typically managing only 0.5 to 1 hectare of coffee cultivation (Dang, 2024). The Sustainable Trade Initiative (IDH) reports that around 600,000 households in Vietnam have coffee-growing areas of less than 1 hectare, contributing to 95% of the country's coffee production (IDH, 2023).

4.2. The potential impacts of the European Union deforestation regulation (EUDR) on Vietnam's coffee supply chains

As mentioned earlier, the EUDR is the EU's latest regulation related to sustainable development, which specifically regulates agricultural products that are deforestation-free. This is an evitable trend in global green consumption, not just in the EU. EUDR prohibits the importation of agricultural products produced on land

that has been sourced from deforested or forest-degrading areas since the cut-off date of 31 December 2020, including livestock farming, cocoa, coffee, palm oil, rubber, soybeans, and wood, as well as products raised or produced using those products such as leather, chocolate, printing paper, furniture, charcoal, and some derivatives of palm oil. Coffee, rubber, wood, and wood products are the main industries in Vietnam affected by this regulation. According to Article 3 of the EUDR, relevant commodities and relevant products shall not be placed or made available on the market or exported, unless all the following conditions are fulfilled: (a) they are deforestation-free; (b) they have been produced in accordance with the relevant legislation of the country of production; and (c) they are covered by a due diligence statement (European Commission, 2023a).

Firstly, 'deforestation-free' means that: (a) the relevant products contain, have been fed with, or have been produced using commodities sourced from land that has not undergone deforestation after 31 December 2020; and (b) products containing or made from wood, the wood must have been harvested without causing forest degradation after the same date.

Secondly, products must be produced in accordance with the relevant laws of the country of production. The EUDR requires that agricultural commodities and products entering the European Union demonstrate their legality, meaning they must comply with the laws and regulations of the producing country. This includes adherence to legal provisions on land rights, environmental protection, forestry regulations, third-party rights, labor rights, internationally protected human rights, and applicable tax, anti-corruption, trade, and customs regulations.

Thirdly, products must be accompanied by a due diligence statement. Due diligence is a step-by-step process involving information collection, risk assessment, and risk mitigation (OECD and FAO, 2023). Under Article 8 of the EUDR, operators are required to conduct due diligence on all relevant products from each supplier before placing them on the market or exporting them. This process includes: (a) gathering the necessary information, data, and documents as specified in Article 9; (b) performing risk assessments as outlined in Article 10; and (c) applying risk mitigation measures as described in Article 11.

According to the European Commission (2021), the estimated costs of complying with the EUDR for small producers, indigenous people, and businesses are significant. (European Commission, 2021). However, as previously mentioned, 95.5% of Vietnam's coffee cultivation occurs in the Central Highlands, a region predominantly inhabited by poor ethnic minority communities. These communities often rely on traditional farming methods that may not meet the stringent environmental and traceability standards required by the EUDR. Additionally, these regions face significant socioeconomic challenges. According to the General Statistics Office (GSO, 2023), the North Midlands and Mountainous Region, along with the Central Highlands, reported the highest Gini coefficients (0.411 and 0.404, respectively) and higher poverty rates compared to other regions (10.7% and 9%, respectively). A 2004 poverty assessment of Vietnam by the World Bank and other organizations revealed that in the Central Highlands, 54% of coffee growers were living in poverty, with 29% classified as extremely poor. Ethnic minorities, who make up 34% of the region's coffee growers, accounted for half of all poor coffee growers and two-thirds of those

considered extremely poor. The Central Highlands is one of the poorest regions in Vietnam, where poverty is closely linked to ethnicity (World Bank, 2004).

Additionally, coffee cultivation in Vietnam's Central Highlands is primarily managed by farmer households and smallholders, many of whom work on just a few hectares of land. 600,000 households have coffee-growing areas of less than 1 hectare (IDH, 2023). These producers often lack access to modern tracking systems and sustainability certifications, making it difficult for them to prove that their coffee is not linked to deforested areas. Thus, compliance with EUDR traceability standards often requires significant investments in technology, including GPS tracking systems, satellite monitoring, and certification processes, all of which impose additional financial burdens on coffee farmers. Furthermore, the costs of transitioning to sustainable agricultural practices, such as adopting environmentally friendly techniques, implementing reforestation efforts, and reducing chemical inputs, pose another significant challenge for coffee farmers.

Firstly, coffee farmers in Vietnam may face exclusion from supply chains due to the complexities of implementing traceability systems. Zhunusova et al. (2022) note that due diligence legislation may disengage smallholders because of the high transaction costs involved, potentially leading to further deforestation due to loss of livelihood. Smallholders risk exclusion from value chains associated with relevant commodities (European Commission, 2021; Zhunusova et al., 2022). Similarly, Cesar de Oliveira et al. (2024) also highlight that smallholders in Brazil, particularly those involved in value chains such as coffee and cocoa, are likely to face significant financial barriers in complying with EUDR, despite their products presenting a low risk of deforestation (Cesar de Oliveira et al., 2024). In line with this observation, the literature on the implementation of zero-deforestation value chain interventions suggests that larger landholders or those who already meet compliance criteria are more likely to participate in international value chains with deforestation standards, while smallholders tend to be excluded and shift production to local markets, often at lower prices (Carlson et al., 2018; Garrett et al., 2021).

Secondly, ethnic minority communities in the region encounter linguistic and cultural barriers that hinder their access to information and training on EUDR requirements. The exclusion of farmer households from these supply chains could reduce rural incomes and exacerbate inequality. If coffee growers are excluded from the supply chain, they may cut down their coffee trees and switch to other crops to maintain their livelihoods. According to USDA FAS (2024b), farmers in the Central Highlands region have diversified away from coffee cultivation to add, or switch to, higher-earning crops such as durian and passion fruit. Farmers can earn twice the income growing durian compared to growing coffee (USDA FAS, 2024b). This transition would disrupt agricultural planning and undermine the Vietnamese government's goals for sustainable coffee development.

Thirdly, for Vietnamese coffee exporters, maintaining access to the EU market depends on their ability to comply with EUDR requirements. Failure to meet traceability standards could lead to exclusion from the market, undermining Vietnam's competitive position in the coffee sector. If Vietnamese commodities and products face barriers to entering the EU market, producers and traders may explore opportunities in less regulated markets like China, Colombia, the Philippines, and

Argentina. However, key export markets like the United States, Japan, and South Korea are likely to support the EUDR and could soon implement similar regulations, creating further challenges for Vietnam's agricultural and forestry exports. Therefore, the Vietnamese government should focus on consolidating and expanding its international market presence, leveraging trade agreements to enhance exports, and effectively tapping into the domestic market.

Fourthly, the EUDR not only prohibits the import of agricultural products produced on land linked to deforestation and forest degradation but also requires that these products comply with the relevant laws of the producing country. Currently, around 15%–20% of coffee-growing areas in Vietnam lack land use rights certificates, presenting significant challenges in meeting the EUDR's legal requirements (Dang, 2024). Therefore, the Vietnamese government needs to speed up the process of granting land use rights to coffee growers in the Central Highlands to reduce barriers under EUDR regulations.

Although the EUDR presents significant challenges, it also offers substantial opportunities for Vietnam's coffee industry to adopt more sustainable practices and build resilience for the future. By investing in sustainable farming methods, improving land use practices, and minimizing environmental impacts, Vietnam's coffee producers can align with global sustainability trends and enhance the value of their products. Exporters who successfully transition to sustainable production and transparent supply chains can position Vietnamese coffee as a high-quality, eco-friendly brand in the global market. These efforts not only boost the reputation of Vietnamese coffee in international markets but also open doors to premium segments where consumers are willing to pay higher prices for sustainably sourced products, contributing to long-term market stability.

4.3. Vietnam's contribution to tackling global deforestation

In recent years, Vietnam has made significant efforts to fulfill its obligations under international treaties related to deforestation-free products. The country has issued numerous legal documents aimed at environmental protection, contributing to the implementation of international environmental agreements. This legal framework has been key in enforcing environmental obligations within Vietnam and in supporting global environmental initiatives.

At COP26, Vietnam committed to achieving net-zero emissions by mid-century and pledged to reduce global methane emissions by 2030. The country also endorsed the Glasgow Leaders' Declaration on Forests and Land Use and the Global Coal to Clean Power Transition Statement. Additionally, the European Union and Vietnam have signed a Voluntary Partnership Agreement (VPA) under the Forest Law Enforcement, Governance, and Trade (FLEGT) initiative. The commitments under this VPA are already reflected in Vietnam's recently adopted Forestry Law, which came into force in January 2019. These actions highlight Vietnam's proactive stance on environmental protection and its alignment with international efforts to combat deforestation and promote sustainable land use.

Vietnam has enacted specific regulations to reduce the risk of deforestation and forest degradation. These include: Decision No. 523/QD-TTg, issued on 1 April 2021,

by the Prime Minister, approving the Vietnam Forestry Development Strategy for the 2021–2030 period with a vision towards 2050; Resolution No. 84/NQ-CP, dated 5 August 2021, by the Government, approving the Sustainable Forestry Development Program for the 2021–2025 period; Decision No. 809/QD-TTg, dated 12 July 2022, by the Prime Minister, approving the Program on Sustainable Forestry Development for the 2021–2025 period; and Circular No. 26/2022/TT-BNNPTNT, issued on 30 December 2022, by the Ministry of Agriculture and Rural Development, which regulates the management and traceability of forest products.

Currently, the Ministry of Agriculture and Rural Development (MARD) is finalizing an action plan to adapt to the EUDR, as mandated by Resolution No. 88/NQ-CP dated 8 June 2023, issued by the Government. In the meantime, MARD has coordinated with relevant stakeholders to carry out various preparatory activities for EUDR adaptation. To facilitate EUDR implementation and support the development of legal frameworks to combat deforestation, MARD issued Document No. 5179/BNN-HTQT on 1 August 2023, outlining the Action Plan Framework for EUDR adaptation, which was sent to the Chairpersons of People's Committees of provinces and centrally affiliated cities. MARD has requested that these local governments align and supplement their local action plans to comply with EUDR requirements, thereby creating favorable conditions for Vietnam to implement the European Union's EUDR regulations.

To address these challenges, the Vietnamese government should focus on strengthening legal frameworks, improving traceability systems, and supporting smallholders to ensure their inclusion in sustainable supply chains.

First, the government must develop and implement traceability standards and regulations tailored to regional supply chains, specifying the exact locations of each planting area. This should involve digitizing cadastral maps of these areas, applying robust certification systems for coffee, rubber, wood, and other EUDR-affected products, and establishing mechanisms for verifying product origins. Additionally, encrypted traceability codes and location-tracking systems should be introduced for products and goods. A national information portal for product and goods traceability is also essential.

Second, to support the transition to a more sustainable coffee industry, the government should provide financial assistance, training programs, and technical support to farmers and exporters. Initiatives aimed at promoting sustainable agriculture, enhancing supply chain transparency, and fostering public-private partnerships will be crucial in helping the coffee sector adapt to new regulations.

Third, international cooperation is vital. Partnerships with international organizations, development agencies, and multinational corporations can facilitate the transfer of knowledge, technology, and resources needed to meet EUDR standards. Collaborating with global stakeholders will help ensure that Vietnam's coffee industry remains competitive and resilient in the face of evolving market demands.

Expanding Vietnam's presence in international markets through trade agreements, while also capitalizing on the domestic market, can further help mitigate the impact of stringent regulations like the EUDR. By addressing these key areas, Vietnam can help its smallholder farmers overcome the challenges posed by the EUDR, ensuring their continued participation in global coffee supply chains while

promoting sustainable practices.

Vietnam's current legal system does not regulate the geographical origin of batches of exported agricultural and forestry products. Additionally, the country does not yet have a comprehensive map reflecting its forest status as of 31 December 2020, which is necessary for verifying the deforestation risk of products as required by the EUDR's due diligence process. In cases where Vietnam's agricultural and forestry products are unable to be exported to the EU market, producers and traders may attempt to shift exports to less stringent markets such as China, Colombia, the Philippines, and Argentina. However, other key export markets for Vietnam, including the United States, Japan, and South Korea, are likely to support the EUDR and could soon implement similar regulations or policies, creating further challenges for Vietnam's agricultural and forestry exports.

Therefore, the Vietnamese government should prioritize consolidating and expanding its presence in international markets, leveraging trade agreements to boost exports, and tapping effectively into the domestic market. Government support is crucial in this context. Policy reforms focusing on sustainability and environmental protection are essential for helping Vietnam adapt to EUDR requirements. Initiatives that promote sustainable agriculture, provide financial support, and introduce technology-based solutions for traceability will ensure that small farmers and exporters remain competitive in the EU market.

5. Conclusion

The European Union Deforestation Regulation (EUDR) marks a pivotal effort by the EU to promote sustainable development, ensuring that agricultural products are free from deforestation. This initiative aligns with a broader global push toward more responsible and environmentally conscious consumption. However, Vietnam's coffee sector faces significant challenges due to the EUDR, particularly smallholder farmers and exporters who may struggle to meet the strict traceability and sustainability requirements. To address these obstacles, Vietnam must adopt a comprehensive and strategic approach.

First and foremost, securing land tenure for smallholder farmers should be a top priority. Formalizing land rights will streamline the certification process, align Vietnam with EUDR standards, and empower smallholders to participate actively in global markets. Securing land tenure will streamline certification, support sustainability compliance, and integrate farmers into a more resilient and equitable economic system.

Second, diversifying export markets is crucial to reduce dependence on traditional markets like the EU. By leveraging trade agreements and building relationships with emerging markets, Vietnam can mitigate the risks posed by evolving regulations such as the EUDR. A diversified market strategy will enable the coffee industry to remain flexible and resilient amid global regulatory changes.

Third, establishing an advanced forest monitoring system is essential. This system would verify deforestation alerts and track land use, ensuring that Vietnam's agricultural practices do not contribute to forest degradation. Such measures would not only enhance compliance with the EUDR but also position Vietnam as a leader in

sustainable coffee production, demonstrating its commitment to global environmental goals.

Additionally, developing sophisticated traceability systems tailored to regional supply chains is critical. Digitizing planting area maps, implementing robust certifications for products like coffee, rubber, and wood, and creating encrypted product codes are all necessary steps. A national traceability portal would further enhance transparency and help Vietnam meet the EUDR's due diligence requirements.

Ultimately, the successful implementation of these measures will allow Vietnam to maintain its competitive edge in the global coffee industry while contributing to global sustainability efforts. This goes beyond regulatory compliance; it reflects a future where sustainability and economic growth coexist. Collaboration between the government, private sector, and international partners is vital to ensure the resources, knowledge, and support needed for success. By working together, Vietnam can ensure its smallholder farmers are not left behind in this transformative journey, positioning the country as a key player in the global shift toward a more sustainable and responsible coffee supply chain.

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