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# Efforts to Empower Farmer Groups on Smallholder Oil Palm Plantations Facing the EUDR Anti-Deforestation Policy

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A R T I C L E I N F O

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A B S T R A C T

The European Union has issued an anti-deforestation policy, outlined in the European Union Deforestation Regulation (EUDR), for several commodities, including palm oil products. This policy can lead to the exclusion of products from smallholder oil palm plantations from the global palm oil supply chain. This study aims to formulate efforts to empower farmer groups on smallholder oil palm plantations in response to the EUDR anti-deforestation policy. The methodology used in this study is a qualitative method, also known as an interpretive method, because the research data prioritizes interpretation of data found in the field. The results show that the negative impacts of the EUDR policy can be overcome through farmer group empowerment programs on smallholder oil palm plantations. Empowerment can be carried out through technical empowerment that focuses on increasing the capacity of individuals and farmer groups to master skills, technology, and agricultural practices that comply with EUDR standards. Technical empowerment can be carried out through training in geotagging and digitizing plantation data, implementing Good Agricultural Practices (GAP), and sustainability certification. Empowerment can also be carried out through institutional empowerment, emphasizing the strengthening of farmer organizations as a collective forum to overcome EUDR obstacles by strengthening the organizational capacity of farmer groups, producer cooperatives, multi-party partnerships and collective certification

## INTRODUCTION

The palm oil industry is one of the backbones of the Indonesian economy, contributing significantly to exports and employing millions of workers, particularly in rural areas. Indonesia is the world's largest palm oil exporter. Palm oil exports to various countries, including the European Union. However, this commodity is also often associated with environmental issues such as deforestation, biodiversity loss, and climate change. The rapid development of palm oil cultivation has triggered various social issues such as biodiversity, deforestation, dietary habits, and ethical investment (Rival et al., 2014). With increasing global awareness of the importance of sustainability, various countries, particularly the European Union, have begun implementing anti-deforestation policies outlined in the European Union Deforestation Regulation (EUDR). This policy requires products entering their markets to be free from forest destruction activities. The EU's adoption of the EUDR has brought about major changes in the governance of forest-based commodity trade. This regulation prohibits the import of products originating from lands that experienced deforestation after 2020 and requires suppliers to provide plantation geolocation data and proof of land ownership legality as part of the due diligence process (PASPI Monitor, 2024). This policy aims to reduce the global rate of deforestation, but in practice has significant implications for the Indonesian palm oil supply chain.

Anti-deforestation policies require strict traceability (supply chain tracking) and land legality verification. Many smallholders lack complete documentation or access to traceability technology. Furthermore, limited understanding of international regulations makes them vulnerable to exclusion from export markets. If not properly addressed, these policies have the potential to reduce smallholder competitiveness, lead to lower prices for fresh fruit bunches (FFB), increase the gap between large plantations and smallholders, and encourage high-risk trading practices through informal intermediaries. These policies pose significant challenges for smallholder oil palm plantations operating independently. They must transform to meet global sustainability standards. In this context, strengthening farmer group institutions is a strategic step to ensure economic sustainability while protecting the environment. For large companies with adequate technological resources and traceability systems, compliance with the EUDR may be easier to achieve. However, the situation is different for smallholders, who currently account for approximately 40% of Indonesia's total palm oil production. Many smallholders face limitations in terms of access to technology, financial capacity, administrative understanding, and institutional capacity to meet requirements such as geotagging, land legality documentation, and sustainability certification. Without appropriate interventions, smallholders risk being marginalized from global supply chains, which in turn could negatively impact their livelihoods and exacerbate economic disparities in palm oil-producing regions (Zero Deforestation Hub., 2024).

In this context, empowering farmer groups is a key strategy to help smallholders adapt to the demands of the EUDR. This approach encompasses not only technical capacity building, such as training in geotagging, plantation data

management, and compliance with sustainability standards, but also strengthening farmer group institutions to enable them to act as a platform for collective coordination, advocacy, and certification management. This empowerment is expected to integrate smallholders into supply chains that comply with international regulations without compromising their economic and social sustainability (Permatasari et al., 2024). This study aims to formulate efforts to empower farmer groups in smallholder oil palm plantations in response to the anti-deforestation policies imposed by the European Union.

## LITERATURE REVIEW

### *The Role of Palm Oil in the Indonesian Economy*

Palm oil is a leading national commodity that has a significant contribution to the Indonesian economy. The palm oil sector contributes approximately 3.5% to Gross Domestic Product (GDP) and is an important source of foreign exchange through exports to international markets. This industry also employs millions of workers, both directly on plantations and indirectly through the downstream sector and supporting services. Palm oil plays a strategic role in the Indonesian economy, with the largest contribution of 3.76% to national GDP and 30.32% to agricultural sector GDP. Palm oil commodities contributed 12.7% to total non-oil and gas exports in 2022 and employed 16.2 million people, including 4.2 million direct workers and 12 million indirect workers. The export volume of palm oil in 2021 will reach 27.11 million tons or 60.08% of the total production with a sales value of USD 28.77 billion (BPS, 2023).

In terms of production capacity, in 2017, the area of oil palm plantations in Indonesia jumped to 12.38 million hectares, with a CPO production of 33.94 million tons. In 2021, the area of oil palm plantations increased again by 29.11 percent to 14.62 million hectares, with a CPO production of 45.12 million tons. In terms of ownership, the majority of oil palm plantations in Indonesia are controlled by large private companies, accounting for 55.09 percent in 2018. The second largest area is controlled by smallholder plantations, with a share of 40.62 percent, while the remaining 4.29 percent is controlled by large state-owned plantations. The comparison of land area in 2021 is not much different from 2018, where private plantation companies controlled 8.04 million hectares, or 55.01 percent. Meanwhile, smallholder plantations control 6.03 million hectares, or 41.24 percent, and large state-owned plantations cover 0.55 million hectares, or 3.76 percent (BPS, 2022). In conducting their business, smallholder plantations also collaborate with large private companies and large state-owned plantations in managing their plantations and selling their produce.

The advantages of palm oil compared to other vegetable oil commodities are its high productivity per hectare, flexibility of use (food, oleochemicals, energy), and its role in rural development. Oil palm plants have a much higher productivity level than other vegetable oil crops, making them more efficient in land use. Palm oil productivity reaches 3.8 MT/ha/year, compared to rapeseed oil, which produces only 0.6 MT/ha/year, or soybean oil, which produces no more than 0.5 MT/ha/year. When linked to the conditions of increasing global demand for vegetable oils, the use of palm oil is very appropriate because it has the highest level of efficiency (Sipayung, 2023).

***European Union Deforestation Regulation (EUDR)***

In 2022, the European Union issued an anti-deforestation regulation called the European Union Deforestation Regulation (EUDR). The policies outlined in the EUDR aim to protect forests and prevent deforestation worldwide, with the hope of reducing negative impacts on the environment, biodiversity, and climate change. Furthermore, this policy also aims to encourage more sustainable agricultural and industrial practices, as well as promote fair and responsible trade. The EUDR is expected to halt or reduce trade in commodities whose production is linked to deforestation and forest degradation, thereby suppressing, or even halting, the phenomenon of deforestation and forest degradation globally. The EUDR policy prohibits companies from exporting products linked to deforestation and degradation to the European Union market. The problems of climate change and biodiversity decline, which are current environmental issues, are largely triggered by deforestation and degradation. The European Union believes that the EUDR can contribute to reducing greenhouse gas emissions from deforestation and help address global biodiversity loss by encouraging the consumption of products that do not involve deforestation, as well as reducing the impact on forests worldwide (Pendrill et al., 2019a; Pendrill et al., 2019b; Yazici, 2023).

EUDR is a policy adopted by the European Union to prevent the entry of commodities originating from deforested land after 2020. This policy covers seven main commodities, including palm oil, and requires business actors to provide the geolocation of production land, guarantee that products are free from deforestation, include proof of legal land ownership, and implement procedures of due diligence which is strict. EUDR not only applies to large producers, but also binds the entire supply chain, including smallholders in producing countries. Therefore, this regulation requires a reliable tracking and verification system from upstream to downstream (PASPI Monitor, 2024).

***Smallholders' Challenges in Facing the EUDR***

The EUDR policy has very strict rules, which have caused some producers to be unable to meet those requirements. The fulfillment of EUDR provisions for several commodities in Indonesia are still far from satisfactory, because until now, Indonesia does not have explicit regulations or legal frameworks that prohibit deforestation in the production process of agricultural or plantation commodities. Many plantation companies face the risk of non compliance with the EUDR, especially those with land obtained from the conversion of natural forests after December 31, 2020. This is particularly relevant for palm oil plantations. From a legal standpoint, the main challenge is the fact that 20% of oil palm plantations are located in forest areas, where most do not yet have Business Use Rights (HGU), many farmers do not have Cultivation Registration Certificates (STD-B) and land legality, as well as ISPO certificates (Anam, et al., 2025; Permatasari, et al., 2024).

Smallholder oil palm plantations face a number of significant challenges in complying with the provisions of the European Union Deforestation Regulation (EUDR). The first challenge is the technological and infrastructure limitations. Many smallholders are located in areas with limited internet access

and lack devices such as smartphones or GPS to provide geolocation data on their land, a key requirement of the EUDR. Without digital tools, it is difficult for them to submit location-based data to authorities or buyers in the European Union. The second challenge is low financial capacity. The costs of mapping, certification, and data collection are extremely high, and smallholders rarely have the funds or assistance to cover these costs. Officials often avoid smallholders due to the disproportionate compliance costs compared to their income (EFI, 2025).

The third challenge is low digital literacy and awareness. Many smallholder farmers are unaware of or do not understand the EUDR, even considering it a form of the previous voluntary certification scheme. The fourth challenge is land use legitimacy constraints. Smallholders often lack official land titles, and therefore cannot prove the legality of their land—a requirement for products to be accepted into the EU market. The fifth challenge, complexity and administrative costs. The EUDR requires due diligence procedures at every point in the supply chain, which can be particularly burdensome when multiple intermediaries and incomplete documentation are involved. The lack of an integrated reporting system makes it difficult to trace the origin of commodities down to the smallholder farmer level. The sixth challenge is risk of being excluded from the supply chain. Many smallholders are expected to be excluded from global supply chains if they fail to comply with regulations, putting their incomes at risk (EFI, 2025).

***Empowering Farmer Groups as a Strategic Solution***

Farmer group empowerment refers to the process of increasing farmer capacity through technical, institutional, and social strengthening. In general, farmer groups in Indonesia are still unable to fulfill their intended role. The relatively low performance of farmer groups is due, among other things, to the management's inability to actively implement their duties, group membership is not clearly recorded, the organizational structure is not complete, the productivity of farming is low and the guidance from extension workers is less intensive. Empowerment of farmer groups according to the Minister of Agriculture Number 67/permentan/SM.050/12/2016 is directed at (1) strengthening poktan to become strong and independent farmer institutions; (2) capacity building of members in agribusiness development; and (3) increasing the capacity of the farmer orup in carrying out its functions. Institutional strengthening of farmer groups can be encouraged through: (1) Structuring institutional capacity; (2) Capacity building of institutional resources; (3) Increasing service capacity; (4) Expanding the network of cooperation or partnership (Anam, et al, 2022; Yuniati, et al., 2017)

According to the concept of rural community empowerment, successful adaptation to policies such as the EUDR depends heavily on organized collective support. Empowerment strategies can be divided into two main aspects. The first is the Technical Approach of geotagging and use of GPS. Recording and digitization of plantation data. Implementation of sustainable agricultural practices (GAP – Good Agricultural Practices). Assistance to meet certification

standards such as ISPO (Indonesian Sustainable Palm Oil) or RSPO (Roundtable on Sustainable Palm Oil). The second aspect is the Institutional Approach. Strengthening farmer groups as collective units in price negotiations, market access, and certification. Establishing cooperatives or farmer associations to collectively access financing, training, and technology. Partnerships with companies, NGO's and the government in mentoring programs. Collective certification schemes to reduce costs and increase verification efficiency. Several studies have shown that strengthening farmer group institutions can reduce the risk of market exclusion, increase bargaining power, and facilitate the adoption of technology needed to comply with international regulations (Permatasari et al., 2024; Jelsma et al., 2017).

## METHODOLOGY

The methodology used in this study is a qualitative method or also referred to as an interpretive method because the study data is more concerned with the interpretation of the data found in the field. This method is a constructive method because the data found scattered in the field are then constructed in a theme that is more meaningful and easier to understand (Sugiyono, 2020). This study was conducted through a review of various scientific literatures in the form of journals, articles, and documents related to the theme of efforts to encourage the development of sustainable modern agriculture through empowering farmer groups. Data collection in this study used a literature survey technique, namely a literature search technique through the process of placing, obtaining, reading, and evaluating research literature. The scientific journals and articles collected are qualified journals and articles on a national and international scale.

The search was carried out with the help of search engines: search.proquest.com, science. direct; search.ebscohost.com; google scholar and microsoft academic with keywords covering community empowerment, farmer empowerment, strengthening farmer groups, EUDR, smallholder plantation, empowerment, farmer group, and sustainable palm oil. Furthermore, data processing is carried out by analytical methods, namely the process of analyzing data or information. Data processing is built through the process of reading, understanding and synthesizing scientific journals and articles obtained to develop a concept. This research is basic research focusing on the development of concepts or theories, without practice in the field. This concept needs to be explored further so that it can be applied into reality (Wiguna & Manzilati, 2014).

## RESEARCH RESULT AND DISCUSSION

### *Challenge MappingSmallholders in Facing the EUDR*

The implementation of the EUDR is highly complex and has the potential to disrupt business processes and global palm oil trade. The EUDR regulations require steps for digital geolocation monitoring, digitization of legality, compilation of supply chain information from upstream to downstream, and due diligence processes throughout the supply chain. All of that poses a significant challenge, especially with the relatively short deadline until December 2024. The implementation of the EUDR requires significant time, effort, and costs, which in

turn will increase the costs of palm oil supply from upstream to downstream (Hadi, 2023). The implementation of the European Union Deforestation Regulation (EUDR) requires that palm oil supply chains be deforestation-free and traceable all the way back to the plantation. For smallholders in Indonesia, these requirements pose major challenges that encompass technical, administrative, financial, and institutional aspects (Solidaridad. 2023).

Smallholders facing the EUDR face several challenges. The first is the lack of geolocation information. Farmers generally lack digital information on the geolocation of their land parcels. This information is needed to support traceability and is typically collected as part of land registration activities. The second challenge is the lack of access to traceability systems, making it difficult to separate commodities produced by smallholders. Traceability systems linking products to smallholder production areas are either unavailable or do not cover smallholders due to the lack of geolocation information and the complexity of supply chains associated with the extensive involvement of unregistered intermediaries in the purchase and sale of smallholder products to processors. Product separation in smallholder-intensive supply chains is also logistically challenging and costly. The third challenge is the lack of information on the legal status of smallholder production areas. Smallholders are not well documented and often lack verifiable information on the legal status of the land they cultivate—such as land certificates or Cultivation Registration Certificates (STD-B) and related digital information on the geolocation of their land parcels. However, the lack of documentation does not necessarily mean that smallholders are engaged in cultivation activities. The fourth challenge is the issue of land ownership legality. Many smallholder oil palm production areas are located within nationally designated forest areas or other areas where the government prohibits planting activities, or where concessions have been granted to companies (EFI, 2025).

The fifth challenge is a financial one, which can be a significant barrier. The cost of sustainability certification such as ISPO (Indonesian Sustainable Palm Oil) or the RSPO (Roundtable on Sustainable Palm Oil) can reach millions of rupiah per hectare, not including the costs of land surveys and document collection. Without external support, these expenses are difficult for smallholder farmers whose incomes fluctuate according to the price of Fresh Fruit Bunches (FFB). The sixth challenge is institutional: many farmer groups still lack organizational management, lack a well-organized member registration system, and have minimal access to formal financing institutions. This makes coordination to fulfill EUDR requirements ineffective. If this challenge is not addressed, the risk of market exclusion for smallholders very large. They could lose access to large buyers who are export-oriented to the European Union, so it will encourage to sell products to the domestic market or through informal channels at lower prices (Permatasari, et al., 2024).

***Analysis of Technical Empowerment Model***

Technical empowerment focuses on increasing the capacity of individuals and farmer groups to master agricultural skills, technologies, and practices that meet EUDR standards. Several approaches can be implemented:

1. Training Geotagging and Digitization of Plantation Data. Field-based training with hands-on practice methods (hands-on training) to ensure farmers are able to operate GPS or geolocation applications on smartphones. Development of simple applications that are compatible with inexpensive devices and can be used by offline base, then synchronized when an internet connection is available. Assistance by extension workers or field facilitator which periodically helps update geolocation data.
2. Implementation Good Agricultural Practices (GAP). Teaching proper harvesting techniques to increase oil yield. Implementing balanced fertilization and integrated pest management. Utilization of environmentally friendly technology to reduce land clearing by burning (zero burning).
3. Sustainability Certification. Collective certification for farmer groups to lower costs per member. Integrate the ISPO/RSPO certification process with technical training, ensuring technical empowerment and regulatory compliance go hand in hand (Schoneveld, et al., 2019).

This technical approach has proven effective when combined with institutional support, because the technology and knowledge gained will be more easily adopted if there is an organization that facilitates its collective use.

Analysis of Institutional Empowerment Model

Institutional empowerment emphasizes strengthening farmer organizations as collective platforms to address EUDR barriers. Some relevant models include:

1. Strengthening the Organizational Capacity of Farmer Groups. Organizational management training: member registration, financial bookkeeping, work plan preparation. Creation of a member database containing plantation geolocation data, land legality status, and technical training achievements. Encouraging transparent and accountable leadership within the group.
2. Producer Cooperatives. Establish cooperatives that collectively manage the sale of fresh fruit bunches (FFB), thereby increasing bargaining power. Cooperatives can become collective sustainability certificate holders, bear the initial costs, and then share them proportionally among members. Establish long-term contracts with palm oil mills that comply with the EUDR (Suharno, 2018).
3. Multi-Party Partnerships. Collaboration with large companies that already have sustainable supply chains for technology transfer and market access. Cooperation with NGOs for technical assistance and land legality support. Partnerships with local governments for certification and training programs based on local policies.
4. Collective Certification Scheme. Combining group members' lands for joint certification, thereby reducing audit costs. Utilizing certification bodies that have specific programs for smallholders (Permatasari, 2024).

***Technical and Institutional Linkages in EUDR Adaptation***

Technical and institutional strengthening are two inseparable dimensions in smallholder farmers' and farmer groups' adaptation efforts to the European Union Deforestation Regulation (EUDR). This regulation requires compliance not only with technical aspects, such as traceability and the implementation of Good Agricultural Practices (GAP), but also with institutional aspects, particularly in the form of group governance, internal monitoring systems, and collective certification mechanisms. Technical aspects are directly related to the skills and knowledge of farmers and farmer groups to meet EUDR requirements, such as the use of digital technology, namely the ability to conduct geotagging, land mapping, and digital application-based production recording. This is crucial because the EUDR requires proof of product origin traceability down to geographic coordinates. GAP implementation involves the application of environmentally friendly, sustainable cultivation techniques, including fertilizer and pesticide management, and biodiversity protection. Supply chain management encompasses the ability to understand global supply chain standards, including documentation and land legality verification. Without technical strengthening, farmer groups will face difficulties in proving that their commodities are deforestation-free and comply with sustainability standards set by the European Union (Solidaridad, 2023; Schoneveld et al., 2019).

Institutional aspects act as a collective umbrella that organizes and strengthens the implementation of technical aspects in the field. Some important institutional roles include serving as data collection centers: farmer groups can serve as collective platforms for integrating data of geotagging and legal documents of its members' land. Collective certification mechanism: with a strong institution, certification can be carried out collectively, so that costs and administrative burdens are not entirely borne by individuals. Internal Control System: institutions can develop internal monitoring mechanisms to ensure that all members comply with GAP standards and sustainability regulations. Access to markets and external support: group organizations serve as a bridge between farmers and certification bodies, governments, NGOs, and purchasing companies that require certainty of product origin (Heriyanto, et al., 2024; Jelsma, et al., 2017). Implications of Technical and Institutional Integration.

The relationship between technical and institutional aspects is complementary. For example, training geotagging. It will not be effective if applied to individuals separately, as the resulting data will be fragmented. However, if an institution serves as a central data manager, the information can be integrated into a unified traceability system. Similarly, with certification, successful collective certification requires not only organizational capacity but also the technical skills of its members in meeting GAP standards. In other words, the institution serves as a platform for implementing technical skills, while technical capacity provides substance to the institution's function. If both work in harmony, a sustainable adaptation ecosystem will be created, where farmer groups are able not only to meet EUDR requirements but also to increase their bargaining power and business sustainability in the global market. Integration of technical and institutional framework for EUDR adaptation has important implications, including cost efficiency through collective certification and shared data management.

Strengthening the bargaining position of farmer groups in global supply chains. Improving sustainability because technical and institutional standards require the implementation of environmentally friendly agricultural practices. Access to funding and external support is more open to well-organized farmer groups with a clear technical track record. Therefore, adaptation to the EUDR cannot be viewed solely from a technical or institutional perspective, but must be understood as an integrative process that connects both within a framework of sustainable smallholder farmer empowerment (EFI, 2025).

## CONCLUSIONS AND RECOMMENDATIONS

The implementation of the European Union Deforestation Regulation (EUDR) presents significant challenges for palm oil smallholders in Indonesia, particularly related to technical, administrative, financial, and institutional limitations. Without adequate support, smallholder farmers face a high risk of market exclusion, potentially reducing incomes and widening rural economic disparities.

Empowering farmer groups has proven to be a strategic approach to addressing these challenges. Technical approaches, such as training, geotagging, implementation of Good Agricultural Practices (GAP), and collective certification, can increase the capacity of farmers
meeting EUDR requirements. Meanwhile, institutional strengthening through producer cooperatives, multi-stakeholder partnerships, and digital administration systems can ensure sustainable compliance and farmers' bargaining power in the global market.

Synergy between technical and institutional aspects is key to successful adaptation. Without integration, empowerment efforts tend to be partial and unsustainable. Therefore, adaptation strategies must be designed holistically, involving various stakeholders, and ensuring inclusion of smallholders in deforestation-free supply chains.

Based on the analysis above, there are several policy recommendations that can support the empowerment of oil palm farmer groups in facing the EUDR:

1. National Program for Geolocation of Smallholder Oil Palm Plantations. The government can initiate a program for geolocation data collection of smallholders land nationally, involving extension workers and low-cost technology, to ensure all gardens are documented according to EUDR standards.
2. Collective Certification Financing Scheme. Government subsidies or soft credit schemes for ISPO/RSPO certification costs. Support from purchasing companies in the form of pre financing certification with a harvest cutting mechanism.
3. Strengthening Farmer Institutions. Training programs for farmer group and cooperative management. Digitizing group administration to facilitate reporting of due diligence.
4. Inclusive Multi-Stakeholder Partnerships. Encourage companies, NGOs, and local governments to form Public-Private Partnership (PPP) which focuses on inclusion smallholders in deforestation-free supply chains.

5. Development of Farmer-Friendly Technology. Applications offline-first which can be used in areas with weak signal. Data integration with government platforms to facilitate verification by European Union buyers.

By combining technical and institutional approaches in a planned manner, empowering oil palm farmer groups can be an effective strategy to ensure smallholders remain integrated into global supply chains that comply with the EUDR. The success of this strategy not only maintains international market access but also contributes to rural economic sustainability and environmental preservation

## ADVANCED RESEARCH

The government can develop a national program for geolocation mapping of smallholder oil palm plantations integrated with the EUDR verification system. Provide financial support for sustainability certification through subsidies, soft loans, or other creative financing schemes. Companies and industry players are advised to develop inclusive partnerships that provide access to technology, training, and markets for smallholders. Assist in the establishment of a collective certification system and cover part of the initial costs as a supply chain investment.

Meanwhile, Farmer Groups and Cooperatives can strengthen their management capacity, administrative record-keeping, and internal transparency. Adopt simple digital technology for managing plantation data, land legality, and certification processes. Non-Governmental Organizations (NGOs) and Educational Institutions. Providing long-term technical assistance in implementing sustainable agricultural practices. Organizing digital literacy and certification programs for farmers in palm oil production centers.

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