

THE IMPACT OF EUROPEAN UNION DEFORESTATION REGULATION (*EUDR*) POLICIES FOR EXPORT ACCESS OF CRUMB RUBBER PRODUCTS TO THE EUROPE

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Abstrak

Keywords:

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One of the causes of climate change is deforestation, which leads to increased global emissions and is inseparable from the contribution of countries in the world both from the production process and consumption of resource commodities. Various efforts are continuously being made to mitigate the impact of climate change, which is increasingly concerning with the increase in global temperatures. The European Union is one of the active actors that has launched various environmental policies, one of which is being tested to be implemented since June 29, 2023, the EUDR or European Union Deforestation Regulation. Since before its publication, Indonesia has tried to reject and encourage changes in the legality test requirements for a number of related commodities. This study uses a qualitative descriptive research method with literature studies as a method of data collection sourced from journal articles, books, news, and regulations officially issued by policy makers. In addition, interviews with related parties and presentations given by division heads are also used as data sources in this study. The results of this article indicate that despite the EUDR not being ratified by the Indonesian Government due to the conflict due to the losses that will be experienced by Indonesia, PT Bukit Angkasa Makmur Bengkulu continues to prepare a number of relevant task divisions for work departments in preparing PT products. KTI to comply with EUDR due diligence requirements.

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INTRODUCTION

According to Robinson et al. (2023), the concept of international trade, in the interest of achieving primary profit-based goals in the industrial era, is also supported by globalization, where the world is increasingly borderless in access to all areas. International trade is increasing in intensity, along with regulations and policies that

govern all international trade processes through export-import activities between countries worldwide. With the aim of meeting the country's commodity needs, openness to international market access is increasingly being increased to create a free market between countries. Historically, international trade is by no means new. International trade, defined as trade involving states, was first recorded around the European Middle Ages and began to be researched, encompassing the instincts and functions of the state by political thinkers and philosophers of that time.

Mercantilism, in international economic theory by Widodo, E. S. (2025), emphasizes the coercive understanding of the economic fundamentals of nations from the 15th to 18th centuries. According to mercantilism, state development is strongly influenced by wealth and power, supported by military strength and economic capabilities to prevent invasion by other nations. The main point of mercantilism is that a country must increase exports more than imports to become a wealthy nation, which is also seen from the accumulation of gold and silver ownership. In mercantilism, all economic activities are centralized and determined by the state, because any disorganization in the economic process will disrupt a country's economic structure. In terms of advantages, mercantilism tends to provide a sense of security through the dominance of the state as the main actor that maintains its economic stability. However, mercantilism views relations between countries as a zero-sum game, where if one country gains, the other country is certain to get nothing, leading to conflict between the two countries (FAO, & UNEP. (2020).

Agovino, M., et al (2023). Liberalism, as proposed by Adam Smith, considers mercantilism, a centralized economic structure system under state intervention, completely untrustworthy. Instead, the state must provide resources to its citizens. Liberalism itself emerged as a result of opposition to the dominance of mercantilism in governments in the 18th century in England, the United States, and Western Europe by a number of figures, including John Maynard Keynes, Milton Friedman, Friedrich Hayer, David Ricardo, and Adam Smith. In his book, Adam Smith stated the assumption that the international economy should be harmonious rather than competitive as implemented by mercantilism. A harmonious economy itself can be realized through a commitment to liberal economic theory that embodies free trade and rejects a number of prohibitions and tariffs that prevent market expansion; the market will expand naturally after fulfilling community needs without the need for intervention; market competition under market harmony will lead to economic growth and market efficiency (European Commission, 2024).

According to Bager, S. L., et al (2021) Climate change has long been a topic of discussion in many countries around the world, climate change itself includes rising temperatures, heat waves, droughts; increased risk of rain, storms, and floods; and the percentage of carbon dioxide in the atmosphere caused by the inability to maintain the balance of nature and human activities that contribute to greater emission production (Nuraini, A. T., & Zahidi, M. S. (2023). With the main goal of preventing an increase in greenhouse gas emissions and keeping the average temperature increase below 2⁰ Celsius from the pre-industrial era, and the largest and most significant contributor to emissions is household activities, public awareness and efforts in reducing the impact of climate change are not sufficiently considered in the research and political spheres (European Central Bank. (2024).

The increase in temperature has had a visible impact on human life and ecosystems, including increased intensity of droughts, floods, extreme weather, rising sea levels, and the extinction of flora and fauna, which disrupt the perfect ecosystem, human life including food scarcity, increased poverty, and increased migration (European Commission. (2022). With efforts to limit the increase in temperature agreed by a number of researchers and national governments, namely limiting the increase in global temperature to no more than 1.5⁰C, it is hoped that the worst impacts of climate change can be avoided while maintaining a climate where life can still survive in maximum conditions.

Gabel, M. J. (2023). The emissions that dominate the total greenhouse gas emissions that cause climate change are carbon dioxide from the combustion of fossil fuels, industrial production, and land use changes; followed by methane from livestock, rice cultivation, biomass burning, organic waste, and fossil fuel production; and nitrous oxide from nitrogen fertilizers spread on the ground. The percentage of greenhouse gas emissions consists of carbon dioxide at 74.4%, methane at 17.3%, nitrous oxide at 6.2%, and other gases at 2.1% (Ritchie et al., 2020). In 2022, greenhouse gas emissions were recorded to reach 58 billion metric tons (Kharas et al., 2022) with the European Union as one of the largest contributors after China and the United States, reaching 941 million metric tons in the first quarter of 2023 (European Union, 2023).

According to Bager et al., (2021), human-induced forest destruction, commonly referred to as deforestation, is the second-largest contributor to greenhouse gas emissions after the burning of fossil fuels and is a contributing factor to climate change, along with the extinction of flora and fauna. Land conversion to rice fields and grazing land is a common reason for deforestation, primarily through the complete clearing of trees. However, deforestation can also be caused by fires caused by friction between trees, and partial logging is also classified as deforestation. According to the 2020 Global Forest Resources Assessment, forests cover 30.8% of the world's land area, with an area of 4.06 billion hectares unevenly distributed throughout the world. The ten countries with the largest forest areas include Russia (815 million hectares), Brazil (497 million hectares), Canada (347 million hectares), the United States (310 million hectares), China (220 million hectares), Australia (134 million hectares), the Democratic Republic of the Congo (126 million hectares), Indonesia (92 million hectares), Peru and India (72 million hectares), and another 1,375 million hectares spread across other countries (FAO & UNEP, 2020).

From 1990 to 2020, an estimated 420 million hectares of forest were lost due to deforestation. However, the rate of deforestation has decreased significantly since 1990–2000, from 16 million hectares per year to 10 million hectares per year in 2015–2020 (FAO & UNEP, 2020, pp. 12–14). The European Union, as the world's largest single market, contributes 10% of global deforestation originating from consumption and the supply chain of goods (Trent, 2023). Therefore, the European Union Commission submitted a proposal for the European Union Deforestation-free Regulations or EUDR.

Kapoor, A., & Klindt, T. (2023). The European Union Deforestation-Free Regulations (EUDR) are an extension of several previous policies, reflecting the European Union's growing concern, driven by the citizens of its member states, who are beginning to urge action on increasing greenhouse gas emissions, primarily due to the EU's high consumption, coupled with the ineffectiveness of existing policies and efforts globally, which have had little impact, particularly in halting deforestation, structural

changes in forest cover, and the scarcity of flora and fauna (Regulation/EU, 2023). The regulation, which aims to increase the EU's contribution to reducing deforestation and structural changes in forest cover, while promoting awareness of human rights and indigenous groups, will ensure that commodities circulating in the EU market meet certain requirements (Kapoor & Klindt, 2023). One of the commodities covered by this regulation is wood and its derivatives.

This background demonstrates the urgency of adjusting export strategies for Indonesian timber companies amidst stringent European environmental regulations. So it is necessary to analyze the impact of the European Union Deforestation Regulation (EUDR) policy on the export access of crumb rubber of PT Bukit Angkasa Makmur Bengkulu to the European Union. The location selection is based on the position of PT Bukit Angkasa Makmur as an active exporter to Europe, which requires the fulfillment of deforestation-free standards in order to maintain the market based on the important points of the research background on the position of PT Bukit Angkasa Makmur which is a producer of natural rubber into crumb rubber that is export-oriented to Japan, Europe, and Asia has an EUDR connection that is directly affected by the EUDR policy that requires deforestation-free commodities and has traceability.

LITERATURE REVIEW

EUDR (European Union Deforestation Regulation)

According to Robinson, R., et al (2023), the European Union Deforestation Regulation (EUDR), or Regulation (EU) 2023/1115, prohibits the sale of products linked to deforestation/forest degradation on the European Union market after December 31, 2020. Key commodities include livestock, cocoa, coffee, palm oil, rubber, soy, and timber, effective December 30, 2026 (large businesses) or June 30, 2027 (small businesses). Key Aspects of the EUDR:

1. Traceability: Products must be traceable to the specific land (geolocation coordinates) where they were produced.
2. Due Diligence: Operators must submit a "Due Diligence Declaration" attesting that the product is deforestation-free and legal under local law.
3. Scope: Covers products imported and exported within the European Union, including many derivatives.
4. Sanctions: Member states will impose sanctions, which can include fines of up to 4% of the EU's annual turnover, confiscation of products/revenues, and temporary bans from the EU market.

EUDR Implementation:

1. Start Date: The regulation was originally set for December 30, 2024.
2. Delayed Deadline: Due to readiness pressures, implementation has now been postponed to December 30, 2026, for large/medium-sized operators and June 30, 2027, for micro/small enterprises.
3. Risk Benchmarking: The EU will classify countries as low, medium, or high risk, which will affect the intensity of due diligence required.

Crumb Rubber Products

The crumb rubber (SIR) production process involves processing smallholder rubber (BOKAR) in the form of slabs or lumps through the stages of cleaning, size reduction

(crumpling), washing, drying, and pressing. The raw material is crushed into small granules to increase the surface area, washed, dried in a dryer, and then pressed into bales. (Bursamin, 2026).

Details of the crumb rubber production process:

1. Raw Material Reception and Sorting: BOKAR (latex residue/coagulum) is received from farmers and separated based on cleanliness level.
2. Cleaning (Pre-cleaning/Washing): BOKAR is washed and cleaned of physical impurities such as soil, sand, or bark.
3. Size Reduction (Milling/Breaking): The material is crushed into small particles using a hammer mill or pre-breaker to facilitate washing and drying.
4. Washing and Crumpling (Macerator/Crepper): The material is further crushed into small granules (crepe) through several grinding processes.
5. Drying: The rubber crumb is dried in a dryer at high temperatures to reduce the water and impurities.
6. Pressing/Baling: The dried rubber is pressed using a packing press into bales of a certain standard weight (usually 33.33 kg or 35 kg).
7. Inspection (Quality Control/Detector): The rubber blocks pass through a metal detector to ensure they are free from contaminants.
8. Packaging: The bales are wrapped in polyethylene plastic and ready for market..

International Trading

IPCC (2025) The crumb rubber market remains promising due to high demand for tires and other consumer products, although producers face pressure from low prices and leaf fall disease. Indonesia is one of the world's largest producers and exporters of crumb rubber (SIR), with 75–80% of production exported to major destinations such as Japan, the US, China, and India. This product is primarily used as a raw material for tires, shoe soles, and other industrial components, with SIR 20 as a leading export product (Indonesian Ministry of Foreign Affairs, 2023). Points in the international trade of Crumb Rubber commodities:

1. Indonesia is the second-largest producer/exporter of natural rubber after Thailand, controlling approximately 20% of the global market share.
2. Crumb rubber is processed into standard crumb rubber (Standard Indonesian Rubber/SIR), with SIR 20 being the backbone of exports (91-95% of total rubber exports).
3. Major markets include the United States, Japan, China, India, and South Korea.
4. High dependence on exports (almost 80% of production) makes this industry vulnerable to global market price fluctuations and declining demand.
5. Crumb rubber prices are influenced by tire industry demand, productivity, and environmental policies such as the European Union Deforestation-Free Regulation (EUDR).

International Standards

According to Kharas, H., et al. (2022), crumb rubber from processed natural rubber generally refers to the Technically Specified Rubber (TSR) standard. In Indonesia, this standard is known as Standard Indonesian Rubber (SIR), specifically SIR 20, which complies with global export technical specifications. For recycled crumb rubber (tire waste), the standard involves mechanical separation from other components such as steel

and fiber. Points in the crumb rubber commodity standard:

1. TSR (Technically Specified Rubber) is the most common international standard for natural rubber processed into crumb rubber, focusing on technical specifications (impurity content, ash, volatile matter, etc.).
2. SIR (Standard Indonesian Rubber) is internationally recognized, with SIR 20 being the most widely produced type (approximately 95% of the total).
3. Green Industry Standards (SIH) require compliance with green industry standards (Ministry of Industry Regulation No. 34 of 2021) for sustainable production processes.
4. Physical characteristics of crumb rubber from recycled tires. Standards include particle size (typically 0.075–4.75 mm) and removal of non-rubber materials.
5. The main parameters assessed include impurity content, volatile matter content, ash content, and viscosity (POE).

Ministry of Environment and Forestry (2025). An integrated system ensures that crumb rubber produced, whether from latex coagulum or sit rubber, has consistent quality for the tire and textile industries. Integrated ISO Crumb Rubber refers to compliance with international (ISO 9001 & 14001) and national (SNI 1903 2017) quality and environmental standards throughout the SIR (Standard Indonesian Rubber) production chain, from raw material receipt, mechanical/chemical processing, to packaging, which is often managed through an integrated management system.

European Union Deforestation Regulation (EUDR) Policy

European Commission. (2023) The implementation of the EUDR is a crucial momentum for the Indonesian commodity industry to strengthen sustainability governance and improve supply chain traceability to maintain access to the European Union market.

The EUDR (European Union Deforestation Regulation) is a European Union regulation that prohibits the import of deforestation-related products into the EU market starting in late 2025/2026. Products such as palm oil, timber, coffee, cocoa, rubber, soybeans, and beef must be deforestation-free by December 31, 2020, legally binding, and have geolocation data (Coordinating Ministry for Economic Affairs of the Republic of Indonesia, 2023). Key Points of the EUDR:

1. Reducing the EU's contribution to global deforestation and forest degradation.
2. Affected Commodities: Coffee, cocoa, rubber, palm oil, soybeans, beef, and timber, including derivative products (e.g., furniture, chocolate).
3. The EUDR is planned to apply to large operators on December 30, 2025, and to MSMEs on June 30, 2027.
4. Traceability to land coordinates (geolocation) and due diligence documents proving deforestation-free and legal products.
5. The EU Risk System will categorize countries as low, standard, or high risk.

EUDR Requirements for Implementing European Union Policy

According to Ritchie, H., et al. (2020), the main requirements of the EUDR (European Union Deforestation Regulation) are that commodities (palm oil, coffee, cocoa, rubber, timber, soybeans, beef) entering the European Union must be deforestation-free (land not cleared after December 31, 2020), legal in the country of origin, and have due diligence documentation. Geolocation data must include 6 decimal places, especially for polygons on large areas, to ensure supply chain transparency. The

following are the details of the EUDR requirements:

1. Deforestation-Free: Production does not originate from land that has experienced deforestation or forest degradation after December 31, 2020.
2. Traceability & Geolocation: GPS coordinates (points or polygons) of the exact location of the production area must be provided.
3. Legal Compliance (Legality) in accordance with the laws and regulations of the country of origin, including land tenure, environmental, and labor rights.
3. A Due Diligence Statement must be submitted, proving the negligible risk of non-compliance before the product is sold in the EU market.
4. Regulated commodities: Palm oil, cocoa, coffee, rubber, soy, timber, and beef, as well as their derivative products (such as leather, furniture, chocolate).
5. The EUDR officially comes into force for large companies on December 30, 2025, and for small businesses (SMEs) on June 30, 2026.

Crumb Rubber Export Company Policy

Robinson, R., et al. (2023). This policy aims to increase competitiveness, maintain the image of Indonesian rubber quality in the global market (Japan, the US, China, India, South Korea), and maximize foreign exchange earnings. Indonesia's crumb rubber export policy is strictly regulated by the Ministry of Trade, primarily through Ministerial Regulation No. 1 of 2026, which requires exporters to possess a Producer Identification Mark (TPP SIR), comply with SNI 1903:2017, and adhere to quality and technical standards for processed rubber materials. Labeling on the rubber band, strict quality control, and compliance with the International Tripartite Rubber Council (ITRC) are mandatory requirements, with potential certification revocation for violators (Office of the Assistant to the Deputy Cabinet Secretary for State Documents & Translation, 2023).

Key Export Policies and Provisions:

1. Exports may only be conducted by producer exporters who have a TPP SIR, which is registered via the OSS or SIMPKTN systems.
2. Products must comply with the Indonesian National Standard (SNI) 1903:2017 to ensure the quality of the Indonesian Rubber Standard (SIR).
3. Implementation of recommended contaminant limits, dry rubber content, and coagulant.
4. Each container/bundle must display the SIR TPP code, SIR type, and manufacturer's identity.
5. Compliance with ITRC (International Tripartite Rubber Council) policies to stabilize prices.
6. Violation of SNI provisions may result in the revocation of the SPPT-SNI (Product Certificate for Use of the SNI Mark).

The Impact of the EUDR Policy on Export Access for Crumb Rubber Products

According to Kapoor, A., & Klindt, T. (2023), one of the causes of climate change is deforestation, which leads to increased global emissions and is inextricably linked to the contribution of countries worldwide, both through the production and consumption of resource commodities. Continuous efforts are being made to mitigate the impacts of climate change, which are becoming increasingly concerning due to rising global temperatures. The European Union is one of the active actors that has launched various

environmental policies, one of which is the EUDR, or European Union Deforestation Regulation, which is being piloted and will be implemented starting June 29, 2023.

Since before its publication, Indonesia has been pushing for and rejecting changes in legality testing requirements for a number of related commodities. This research uses a qualitative descriptive research method with a literature review as the data collection method, sourced from journal articles, books, news, and regulations officially issued by policymakers. Additionally, interviews with relevant parties and presentations from division heads were also used as data sources. The results of this article show that the Indonesian government has not yet ratified the EUDR due to the conflict due to the losses that Indonesia will experience.

Implementation of the European Union Deforestation Regulation (EUDR)

Gabel, M. J. (2023) The implementation of the EUDR aims to ensure that products entering the European Union market do not originate from deforested areas. The European Union Deforestation Regulation (EUDR) requires commodity products (palm oil, coffee, cocoa, rubber, wood, soybeans, and beef) entering the European Union market to be deforestation-free after December 31, 2020. The agreed implementation of the EUDR has been postponed to December 30, 2025 (large companies) and June 30, 2026 (SMEs). The following are key points in implementing the EUDR:

1. Products must be deforestation-free, produced in accordance with the laws of the country of origin, and include a due diligence statement.
2. Exporters are required to provide precise GPS coordinates (geolocation data) of the plantation to ensure traceability.
3. The EU Benchmarking System will categorize countries based on deforestation risk (low, standard, high), which will determine the stringency of inspection procedures.
4. This policy is considered burdensome, especially for smallholders due to high costs and the need for traceability all the way to the upstream.
5. The government is strengthening the ISPO certification system, accelerating the registration of STDB (Cultivation Registration Certificate) for geolocation data, and developing a National Dashboard.
6. Indonesia and Malaysia are advocating through a Joint Task Force to discuss the impact on smallholders and seek a moratorium/relaxation.

Corporate Sustainability Strategy to the EUDR

RubberWay Risk Assessment Methodology (2023) Geolocation polygon points are a collection of geographic coordinates (latitude, longitude) that form a closed boundary of an area on a map, often used for zoning, permitting (OSS), or mapping. Polygons are created by marking corner points in Google Earth or other GIS tools, then saving them in KML/KMZ or SHP format. Here are the details regarding geolocation polygon points:

1. Creating a Polygon (Geolocation): Google Earth Pro (Desktop): Open the application, search for a location, select the "Add Polygon" feature (pentagon/area icon), click on the corners of the land until you return to the starting point to close the area. 2. Digital Maps/OSS: Open a mapping tool (e.g., smartlegal.id), search for a location, activate the "Polygon" (pentagon) icon, and draw the land boundary. Save in KML/KMZ format or export to a SHP (Shapefile) file for GIS purposes.
2. Polygon Data Format: The resulting polygon data consists of a series of vertices that

define an area. Common formats include KML/KMZ (Google Earth's standard format), GeoJSON, a JSON-based format that is easy to parse and read, Shapefile (SHP), a standard format for GIS software, and WKT (Well-Known Text), a text representation of geometry.

3. Functions and Uses: OSS permits are used to mark business location boundaries required for permit applications, Spatial Analysis to determine whether a point is inside or outside an area (point-in-polygon), Area and Perimeter: Google Earth automatically calculates the area and perimeter after the polygon is created.
4. Create polygons with precision to ensure the vertices follow the land boundaries correctly. Ensure the polygon lines close completely (return to the starting point) to create the area. If you need an SHP file, use an online converter or GIS software to convert KML to SHP.

RESEARCH METHODS

Rubberway Digital Risk Mapping Solution (2022) Research methods for analyzing the impact of the EUDR (European Union Deforestation Regulation) policy on crumb rubber exports generally use a descriptive qualitative or mixed methods approach. The primary focus is on analyzing supply chains, traceability requirements, and technical trade barriers. The following are the relevant research method components:

1. Research Approach and Type

- ~ Descriptive Qualitative: Describes the impact of the policy with in-depth data, often used in case studies of specific rubber companies or exporters.
- ~ Case Study: Analyzes in-depth how one or more crumb rubber companies adapt to EUDR due diligence requirements.

2. Data Collection Techniques

- ~ Literature/Document Study: Analyzes official EUDR regulations, policy documents, rubber industry reports, and literature related to the impact of environmental regulations.
- ~ In-depth Interviews: Conducted with stakeholders (exporters, rubber associations, farmers, and EU representatives) to understand operational constraints and compliance costs.
- ~ Supply Chain Observation: Reviewing traceability from plantations to crumb rubber mills.

3. Data Analysis

- ~ Assess the extent to which EUDR regulations (e.g., the requirement for proof of deforestation after December 31, 2020) impact market access for Indonesian crumb rubber.
- ~ Identify changes in export volumes, certification costs, and potential market diversion due to stringent traceability requirements.

RESULTS AND DISCUSSION

PT Bukit Angkasa Makmur (BAM) is a natural rubber (crumb rubber) manufacturing company founded in 1989 and located on Jalan Raya Bengkulu, Curup Kembang Seri Talang Empat, Central Bengkulu Regency, Bengkulu Province. PT Bukit Angkasa Makmur is a high-quality crumb rubber producer, serving various leading customers in the tire industry, both nationally and internationally. Their key partners

include major tire brands such as Michelin, Gajah Tunggal, Bridgestone, Goodyear, Sumitomo, Cooper, Firestone, Goodrich, Yokohama, Pirelli, and Hankook.

The research will focus on EUDR requirements, which require rubber products to have geographic coordinates (GPS) of the land, be deforestation-free, and be produced in accordance with local laws. This approach is relevant to examining the challenges faced by MSMEs or smallholder rubber farmers in meeting due diligence. One of the causes of climate change is deforestation, which leads to increased global emissions and is inextricably linked to the contribution of countries worldwide, both through the production and consumption of resource commodities. Continuous efforts are being made to mitigate the increasingly concerning impacts of climate change, exacerbated by rising global temperatures. The European Union (EU) is one of the active actors that has launched various environmental policies, one of which is the European Union Deforestation Regulation (EUDR), which is being piloted and scheduled to come into effect on June 29, 2023. Since its publication, Indonesia has been pushing for and rejecting changes to the legality testing requirements for a number of related commodities. The results of this article show that despite the Indonesian government's non-ratification of the EUDR, despite concerns about the potential losses to Indonesia, PT Bukit Angkasa Makmur continues to prepare a number of relevant divisions of tasks across departments to prepare products to comply with EUDR due diligence requirements.

RubberWay is a digital platform and mobile application designed to map, assess, and monitor environmental and social risks in the natural rubber supply chain, particularly focusing on smallholder farmers. Founded by Michelin and used by major producers such as Continental and Goodyear, the platform promotes sustainable practices and traceability from farm to processing plant. It aims to increase transparency and sustainability in the upstream natural rubber industry by identifying risks related to labor, land use, and agricultural practices. The platform's functionality uses questionnaires, often through a mobile app, to collect data from smallholder farmers, intermediaries, and mills, which is then analyzed to provide actionable insights. The initiative is supported by major industry players, including Michelin, Continental, Goodyear, Sumitomo, and Yokohama Rubber. With coverage through the end of 2023, the platform has data from nearly 250,000 small-scale producers in 13 countries.

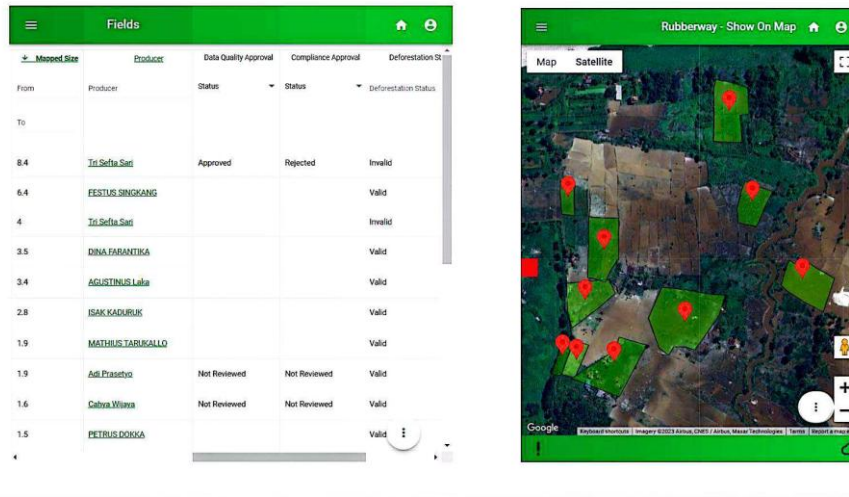
Importers of natural rubber in the European Union must comply with the EU's Deforestation-Free Products (EUDR) regulation. Under the EUDR, tire manufacturers must provide the geolocation of all land where natural rubber is sourced to prove that the product does not contribute to deforestation. One of the natural rubber processors, PT Bukit Angkasa Makmur, has been providing EUDR-compliant rubber to clients through RubberWay Geo-mapping, a tool that allows processors to register farmers and offer EUDR-compliant rubber supplies to buyers.

PT Bukit Angkasa Makmur is developing a strategy to face the European Union Deforestation-Free Regulation (EUDR) and a sustainable natural rubber production model in accordance with the provisions of the European Union (EU) and the new policy, namely the EUDR, which prevents companies from exporting products related to deforestation and degradation to the European Union market. The strategies carried out by rubber industry players in facing the EUDR are establishing a Joint Task Force with other producing countries through international commodity associations, establishing a product certification platform for rubber recognized by the EU, conducting dialogue and

diplomacy for recognition of the established product certification platform. In addition, the crumb rubber processing industry is trying to accelerate the collection of company base data through Siperibun, accelerate the collection of rubber farmer data through e-STDB as traceability material, compile and implement sustainable product certification and mitigate domestic commodity problems, especially at the farmer level, to create a sustainable natural rubber production model.

Figure. 1 RubberWay Geo-mapping

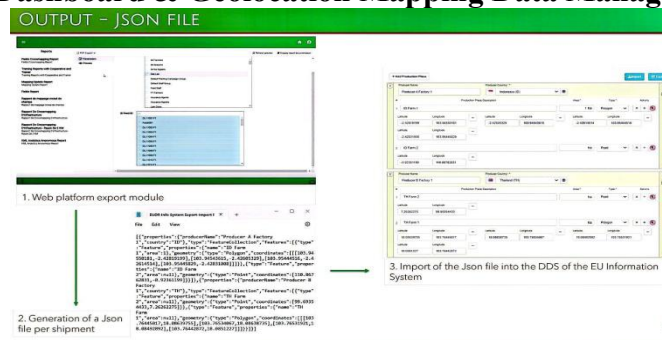
DATA VISUALIZATION – WEB PLATFORM



Resouce, PT Bukit Angkasa Makmur, Bengkulu (2026)

PT Bukit Angkasa Makmur provides a web-based data visualization and management platform designed to improve sustainability and traceability in the natural rubber supply chain. The platform features interactive mapping, EUDR compliance tracking, and a risk assessment dashboard. The platform transforms supplier survey data into actionable risk levels, supporting responsible sourcing. The platform is designed to assist companies in mapping their supply chains and reducing risk by transforming complex field data into visual and actionable insights through Data Visualization in the form of a centralized Web Dashboard & Data Management to access comprehensive data, including geolocation mapping (GeoJSON), and supplier questionnaires.

Figure. 2 Web Dashboard & Geolocation Mapping Data Management (GeoJSON),



Resouce, PT Bukit Angkasa Makmur, Bengkulu (2026)

Compliance & Risk through interactive geographic mapping tools identifies and monitors environmental and social risks across the supply chain for continuous analysis from smallholders to processors. EUDR Ready Reporting generates automated documentation to help buyers comply with the European Union Deforestation Regulation (EUDR) and comes with a mobile app designed for field data collection, with offline functionality for remote areas.

CONCLUSION

The European Union Deforestation-Free Regulation (EUDR) policy has a significant impact as a non-tariff barrier, requiring full traceability and proof of deforestation-free status for Indonesian crumb rubber exporters to the EU. Key risks include increased compliance costs and potential market cessation for smallholders lacking adequate geolocation mapping systems.

The study's findings on the impact of the EUDR on crumb rubber exports highlight new market access barriers; traceability and technology challenges, such as the inability to trace the supply chain from crumb rubber factories to the GPS coordinates of smallholder plantations, which have not yet been digitized; increased compliance costs, including verification, auditing, and due diligence reporting, with total production costs potentially reducing the competitiveness of Indonesian rubber in the European market; and the need for replanting and mapping, which requires accelerated replanting and valid land mapping to ensure compliance with EU environmental standards, given the large number of aging rubber plantations. The strategic solution is to collaborate between the government, private sector, and NGOs crucial to strengthen the long-term capacity of smallholder farmers involving improved governance, sustainability certification (such as ISPO/other sustainable rubber standards), and market diversification beyond the EU.

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