WWF

THE REAL COSTS OF TRACEABLE, DEFORESTATION-FREE COCOA

Recommendations for European stakeholders

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Anthesis

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Summary:
A cost analysis of Ecuadorian cocoa associations

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A cost analysis of Ecuadorian cocoa associations

1.1 BACKGROUND AND OBJECTIVE

WWF Ecuador, WWF Germany and CODESPA are implementing the project “Indigenous Amazonian Chakras, leading the way for a sustainable cocoa supply chain”, which aims to establish a sustainable and traceable cocoa supply chain between Ecuador and Europe. The project is financed by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). The project builds on WWF’s work with indigenous communities in the Ecuadorian Amazon since 2009, promoting sustainable cocoa cultivation in dynamic agroforestry systems known as chakras. To support this initiative, WWF commissioned a study analysing the production and sales costs of dry cocoa and derivatives among Napo Producers Associations. The analysis targeted three associations comprised of Kichwa indigenous communities in Ecuador’s Amazon rainforest.

The study’s objective is to determine the real cost[1] of cocoa production—incorporating additional factors such as marketing or monitoring—in order to ensure a traceable and deforestation-free supply chain, and ultimately strengthening the financial stability of the cocoa value chain.

Ecuador is a major player in the international cocoa market, producing fine aroma cocoa and CCN-51. Around 120,000 families cultivate cocoa on 700,000 hectares. Special cocoa varieties require adherence to environmental and social standards, particularly the European Union Deforestation-Free Regulation (EUDR). Small producer associations play a crucial role in meeting these standards through collective compliance.

The analysis of producers from the Ecuadorian Amazon determined the real cost of traceable and deforestation free cocoa production.

1 Real costs are only costs related to production, including labour costs.

1.2 METHODOLOGY

The methodology focused on establishing production costs for cocoa in both dry and paste forms. Data was gathered from operational personnel, accounting records, and financial reports for the year 2022. The model used employs a dual perspective of operation and finance. This takes into account the operational scope to understand the process, practices and infrastructure from raw material to marketable product (dry cocoa and derivatives); and financial aspects, in order to understand the costing of resources used for the operations.

The cost structure across the three associations includes several major categories: raw material acquisition, which encompasses cocoa purchases, labour, and transportation. Processing costs are primarily labour-related but may also include depreciation and basic services like electricity. Internal quality control and certification—including organic and fair-trade audits—require staffing, training, monitoring, and traceability systems. Marketing and commercialization involve staff salaries, promotional activities, and export-related expenses. Finally, administrative and indirect production costs cover office operations, post-harvest maintenance, technical assistance, and general services like water, electricity, and internet.

To calculate the additional costs associated with EUDR compliance, the study outlines the specific requirements and activities that producers and associations must undertake to demonstrate that their cocoa is both deforestation-free and legally produced. The requirements include:

- Assurance of producer registration and farm georeferencing for deforestation-free verification
- Implementation of legal employment practices and billing systems
- Formalization of operations through tax registration and lawful labour conditions

Fulfilling these requirements demands significant additional resources, and organizations are assessing current capacities, gaps, and necessary measures in order to achieve full compliance. The additional costs were calculated by identifying the required activities under two main regulatory areas (Deforestation-Free and Legality) and estimating the resources and associated costs needed to close the existing compliance gaps. Each activity was assessed by:

- Activity and Necessary Resources (e.g., training, personnel, equipment)
- Current Fulfilment Level (on a scale of 1 to 10)
- Effort Required to Close the Gap (Low, Medium, or High)
- Cost Estimates for each resource

1.3 RESULTS

While all associations cultivate fine aroma cocoa, variations in productivity, technical support, and processing capacity constrain market potential.

The associations cultivate fine aroma cocoa within chakra systems, adhering to organic or Fairtrade certifications. However, productivity levels vary due to differences in agricultural practices and access to technical assistance. This limited cocoa processing infrastructure restricts market potential, while the lack of documented operational knowledge impacts efficiency. Furthermore, associations differ in their technical support structures and certification management. Despite sharing similar operational processes, only Association 3 independently produces cocoa paste.

The lack of infrastructure processing capacity hinders optimization efforts.

To improve financial sustainability, production volumes must increase in order to lower unit costs. Current costing methods underestimate actual expenses by not fully accounting for factors like depreciation and labour. The associations lack detailed cost breakdowns for informed decision-making. Implementing a new costing model that includes financial indicators—such as break-even analysis—would enhance financial planning and efficiency.

The EUDR imposes complex and costly compliance demands.

Compliance with regulations in the Amazon context involves additional tasks like producer registration, farm georeferencing, and formal payment systems, all aligned with national law. However, several challenges have emerged. Traditional Kichwa land inheritance practices may contribute to deforestation concerns. There is also resistance to tax registration due to fears of losing government benefits. Moreover, the required compliance processes are costly and burdensome for associations.

All three producer associations face significant cost increases in order to break even, with EUDR compliance adding substantial financial pressure.

Table 1 compares production costs, market prices, and EUDR compliance costs for three producer associations. Association 2 has the largest production volume as well as the lowest total and EUDR compliance costs per kilogram. Association 3 has the highest production costs, while compliance adds significant financial pressure.

Table 1.
Costs summary of all three associations.

ASSOCIATION	PRODUCED KG DRY IN 2023	VARIABLE COST[2] (USD/KG)	TOTAL COST (USD/KG)	PRICE (USD/KG)	INCREASE NEEDED TO BREAK EVEN[3]	ADDED EUDR COMPLIANCE COSTS (USD/KG)
1	32,363	3.20	5.65	4.00	3x	1.38
2	199,760	3.30	4.91	3.67	4.27x	0.44
3	5,244	8.70	18.01	11.00	4x	7.97

Association 1 anticipates a compliance cost of USD 44,646, mainly for training, logistics, equipment, and staff. The biggest challenges are georeferencing farms and setting up invoicing systems, as producers fear losing government subsidies if formally registered. Employment-related legal compliance is relatively easy.

2 Including marketing or administrative costs

3 Breakeven point = fixed cost/contribution margin

Table 2.
Example of added cost calculation factors from Association 2.

AREAS	ACTIVITIES AND NECESSARY RESOURCES	LEVEL OF FULFILMENT	EFFORT REQUIRED TO CLOSE THE GAP	COST
DEFORESTATION FREE				
Producer	Producer registration	10	Medium	19,768
	Georeferencing of the farm (polygon)	6	Medium	18,356
Assoctiation	Purchase form (Collection registry)	10	Low	500
LEGALITY				
Producer	Billing (training, signature, staff, equipment)	2	High	40,114
	Human rights training and certification	9	Medium	9,560
Association	Formalization of economic activity	10	Low	No additional resources are foreseen
	Working conditions framed in the country's law	10	Low	
				88,298

Association 2 estimates a higher compliance cost of USD 88,298. Divided through the total production volume of 199,760 kg in 2023, the added costs result in 0.44 USD/kg due to requirements for geographic experts, electronic signatures, and dedicated billing personnel. While producer registration is nearly complete, farm georeferencing still poses a moderate challenge. As with Association 1, concerns about losing subsidies hinder acceptance of invoicing. The costs have been calculated as explained in the methodology section. The breakdown of each cost factor is presented in table 2 as an example.

Association 3, which lacks international certifications and has minimal existing compliance infrastructure, estimates a total cost of USD 41,784. Major gaps include zero progress on georeferencing, and significant effort needed for legal employment compliance. Implementation is complicated by internal governance, as staff condition improvements require assembly approval, which may be withheld due to limited financial resources. The cost per unit rises steeply from USD 18.01 to USD 25.98 per kg, or USD 7.97 per kg, largely due to more complex processing (e.g., roasting, refining). Additionally, one of the key requirements to prove that cocoa is deforestation-free is maintaining a purchase and collection register. Since this system is already in place, only a moderate gap remains. To close it, the association would need to hire one additional staff member during the high season and purchase a traceability software license. The estimated combined cost for these measures is USD 1,760 for personnel and USD 860 for the software license.

1.4 CONCLUSION AND RECOMMENDATIONS OF THE STUDY

All three associations are selling below production cost and are advised to improve efficiency, expand product offerings, and adjust business strategies to achieve financial sustainability. Across all three associations, the greatest shared challenge is implementing formal invoicing, which risks the loss of government subsidies for small producers. While compliance introduces financial and logistical burdens, it also offers a potential opportunity to renegotiate product pricing and access premium markets. The costs associated with Association 3 are higher due to the inclusion of additional processing steps such as roasting, cooling, and refining. However, none of the current price points cover the full production costs, making it unfeasible to absorb the additional expenses required for compliance with the EUDR. The main recommendations from the study are:

For all three associations, current prices don't cover full production costs, making it difficult to afford the extra expenses needed to comply with the EUDR.

1

Strengthen Financial Management:
Improve costing methods, align budgets with business goals, and implement long-term cost planning in order to enhance financial sustainability and resilience to market volatility.

2

Support Regulatory Compliance:
Address EUDR-related financial pressures through shared responsibility with buyers, operational adjustments, and strategic use of subsidies rather than short-term support.

3

Promote Diversification and Productivity:
Invest in technical assistance, expand into additional value chains, and develop value-added products to boost productivity, distribute costs, and improve market competitiveness.

2

Recommendations for Stakeholders

2. Recommendations for Stakeholders

European stakeholders throughout the cocoa value chain (importers, manufacturers, retailers, financiers, NGOs, and policymakers) bear decisive responsibility in supporting a just transition toward deforestation-free cocoa under the European Union Deforestation Regulation (EUDR). While legal obligations under EUDR fall primarily on operators and traders within the EU, the practical burden of compliance rests heavily on producers. The following recommendations, grounded in the Ecuadorian context but broadly applicable to other cocoa-sourcing geographies, are organized into three groups of stakeholders: **companies (including buyers and traders), NGOs,** and **policymakers.**

European stakeholders across the cocoa value chain have a key role in supporting a fair transition to deforestation-free cocoa under the EUDR.

2.1 RECOMMENDATIONS FOR COMPANIES AND BUYERS

Companies in the cocoa supply chain are crucial when it comes to aligning sourcing practices with EUDR requirements. By investing in producer resilience and sustainable models, they can help create fairer and more equitable cocoa systems. Although transitioning to compliance may involve higher initial costs, it offers long-term benefits. These include improved yields, better efficiency, and stronger climate resilience. Ultimately, such investments can be both ethically and economically worthwhile. The Ecuadorian study highlights inefficiencies in production and processing at the association level, such as low processing volumes and poorly optimized administrative expenses, which could be addressed through technical support and investment, leading to better resource use and cost control over time. Additionally, climate resilience is vital in the Amazon, where traditional practices and changing weather patterns threaten cocoa productivity. Supporting georeferencing and sustainable land management can help mitigate these risks. Transition costs for sustainability should be integrated into existing company processes like sourcing budgets and supplier programs. This approach reduces the burden on producers while promoting long-term compliance. Several operational actions can directly support producers in meeting sustainable and deforestation-free sourcing requirements.

2.1.2. Technical Measures

A

Invest in geolocation and production data:
Fund and co-develop systems to generate and update parcel-level geospatial data. Collaborate with producers and cooperatives in polygon mapping and date-of-production registration.

B

Enable interoperable traceability systems:
Enable deploy traceability platforms that align with national systems and EU import requirements. Choose digital tools that accommodate the constraints of cooperatives and smallholders.

C

Enable on-the-ground technical capacity:
Train field agents, cooperative staff, and technicians on EUDR compliance, including data collection protocols, legal frameworks, and environmental monitoring.

D

Standardize tools and reduce duplication:
Collaborate with other companies and platforms to create shared compliance tools (e.g., risk classification databases, monitoring dashboards).

E

Promote innovation and cost-effective approaches:
Fund pilot projects for community-led data collection and simplified traceability models that can scale in settings with limited resources.

F

Promote Human Rights:
Human rights audits should be regularly conducted by independent third parties to ensure fair wages, safe working conditions, gender equality, and the protection of land rights in cocoa-producing communities. In addition, establishing transparent grievance mechanisms and providing training on human rights will support ongoing improvement and ensure that workers and communities are protected from exploitation.

2.1.3. Financial Measures

A

Pay sustainable prices:
Go beyond minimum market prices and factor in the full cost of compliance, including traceability, labour protections, and environmental management. According to the study, associations face significant new costs related to deforestation risk analysis, including labour for producer registration, georeferencing systems, and administrative adjustments for traceability and billing. The cost of deforestation-free traceability should be priced in explicitly, especially in the early stages of implementation, when associations may not yet benefit from economies of scale or increased market access. Making these added values visible will encourage associations to invest in traceability systems and ensure that their efforts are recognized and rewarded by buyers. Association 3 has the highest production costs due to additional processing steps (roasting, cooling, and refining) and requires the most substantial cost increases for EUDR compliance.

B

Secure long-term sourcing agreements:
Provide contractual predictability that enables cooperatives and farmers to invest in infrastructure and adapt to EUDR demands. This will stabilize incomes for cocoa producers and protect them from financial instability. Association 2, with the largest production volume, still faces significant costs in order to break even due to EUDR compliance costs and a low price per kg. Developing long-term contracts with such associations can help ensure stability for both the producers and the buyers.

C

Reward verified compliance and improvements:
All three associations face the challenge of selling below production costs. Offering higher premiums or price adjustments for sustainable practices (such as meeting EUDR compliance and achieving certifications like organic or Fairtrade) can create an incentive for these associations to invest in sustainable practices. Performance-based incentives can include a bonus of 10–20% above the base price for verified deforestation-free cocoa, calibrated to cover compliance costs and reward traceability efforts. This would create a clear signal that buyers value transparency and sustainability, particularly for associations that are making significant operational changes with little margin.

D

Facilitate pre-financing and credit access:
Work with financial institutions or offer direct prefinancing to help cooperatives cover up-front compliance costs.

E

Partner with local intermediaries:
Ensure that your suppliers or traders channel support through trusted organizations that work directly with cooperatives.

2.1.4. Structural and Strategic Measures

A

Reduce supply chain fragmentation:
Companies should work directly with producer cooperatives or farmers associations to reduce the number of intermediaries. This not only lowers transaction costs but also increases transparency in pricing, enabling better financial management for producers. Reducing fragmentation ensures that a larger share of the sale price goes directly to farmers rather than getting diluted across various intermediaries.

B

Support local value addition:
The study shows that while all three associations are involved in growing fine aroma cocoa, Association 3 has developed additional processing steps such as cocoa paste production. However, it faces significant financial strain due to the high costs of processing and compliance. This provides an opportunity for companies to support value addition at the origin, where more value can be retained within the local community rather than exported in raw form. Companies should prioritize sourcing cocoa from producers or cooperatives that engage in value-added processing, such as producing cocoa paste or chocolate derivatives.

C

Engage in pre-competitive collaboration:
Companies can collaborate within industry platforms or working groups, such as those focused on sustainable cocoa or deforestation-free supply chains, to collectively address common challenges, like EUDR compliance. These collaborations can reduce the individual burden on each producer by sharing resources, knowledge, and best practices.

2.2 RECOMMENDATIONS FOR NGOs

NGOs play a key bridging role in enabling producer organizations to comply with the EUDR in an inclusive and context-sensitive manner. They support smallholders by providing training, technical assistance, and capacity-building in areas like geolocation, legality, and traceability. NGOs also develop accessible toolkits and assist in establishing digital traceability systems. By managing grassroots funds and creating blended finance models, they help ensure equitable financing. In addition, NGOs advocate for inclusive policies, amplify producer voices, and act as watchdogs to ensure transparency and accountability in supply chains.

2.2.1. Capacity-Building and Technical Facilitation

A

Provide targeted training and accompaniment: Work directly with producer groups to build internal capacities for geolocation data collection, legality verification, and environmental safeguards. The Ecuadorian study has demonstrated that prices do not meet the overall costs of the products. To strengthen the position of the associations, it is essential to professionalize their operations by building capacity in management, finance, and traceability.

B

Develop practical toolkits: Translate EUDR requirements into accessible guides, templates, and training materials. Furthermore, produce reports, case studies, and evaluations that identify on-the-ground challenges.

C

Facilitate data system development: Act as intermediaries in setting up traceability systems or help cooperatives digitize their operations. The study highlights the challenges with EUDR compliance costs and associated tasks like georeferencing, registration, and traceability.

NGOs could advocate for government programs to subsidize these costs, especially for smallholder producers who cannot absorb the expenses.

2.2.2. Support for Equitable Financing

A

Manage funding for grassroots actors:
Act as trusted channels for disbursing donor or private sector funds to smallholder groups.

B

Develop blended finance models:
Collaborate with development finance institutions and companies to design mechanisms combining grants, concessional loans, or guarantees.

2.2.3. Advocacy and Structural Engagement

A

Promote inclusive and participatory EUDR implementation:
Advocate along with EU and national institutions to ensure that the design and rollout of the EUDR reflects the realities of smallholders and marginalized producers. Support producer organizations in building their capacity and securing representation in decision-making spaces, so that their voices shape policies that affect their livelihoods.

B

Coordinate multi-stakeholder processes:
Create or convene spaces for dialogue between producers, buyers, government officials, and financiers. NGOs can play a key role in facilitating collaboration between companies and cooperatives, as well as representing producers' perspectives in national platforms and policymaking spaces. NGOs can serve as trusted intermediaries to channel support when direct relationships are not possible.

C

Watchdog role for due diligence systems:
Act as an independent oversight body to monitor and evaluate whether buyer due diligence processes are conducted fairly, transparently, and inclusively. This includes assessing whether these systems consider the perspectives and rights of all stakeholders. The watchdog should also identify systemic biases, promote accountability, and recommend improvements to ensure ethical and equitable sourcing practices.

2.3 RECOMMENDATIONS FOR POLICYMAKERS

EU and producer country policymakers must ensure effective and fair EUDR implementation by establishing harmonized regulations, centralized data systems, and support structures. This includes providing financial and technical aid, promoting transparency, supporting smallholders, and encouraging global cooperation to reduce deforestation and ensure equitable market access.

2.3.1. Policy Coherence and Regulation Design

A

Ensure harmonization with national systems: Align due diligence expectations with national traceability platforms and forest monitoring systems. This includes recognizing and integrating credible government data and tools into regulatory compliance pathways. Harmonization helps reduce the administrative burden on producers and enhances the credibility of the data used across supply chains.

B

Design proportionate enforcement mechanisms: Develop enforcement systems that recognize the varying capacities of actors across the supply chain. For example, offer differentiated compliance timelines, technical assistance, and simplified documentation procedures for associations as presented in the Ecuadorian study. Proportionality ensures that regulations do not inadvertently exclude or disadvantage vulnerable stakeholders and supports equitable market access.

C

Incorporate learning loops: Embed mechanisms within the regulation for periodic review and adaptation based on real-world implementation outcomes. This includes stakeholder consultations, feedback from affected parties, and ongoing evaluation of compliance costs and benefits. By allowing for mid-course corrections, the regulation can remain effective, practical, and responsive to evolving contexts.

D

Establish centralized interpretation of geospatial data: The responsibility for interpreting geospatial data should not fall solely on producers. Delegating this task creates inconsistencies in compliance assessments, leading to uncertainty and unequal treatment. Instead, a centralized interpretation system should be established to ensure fairness.

2.3.2. Financial and Technical Assistance Instruments

A

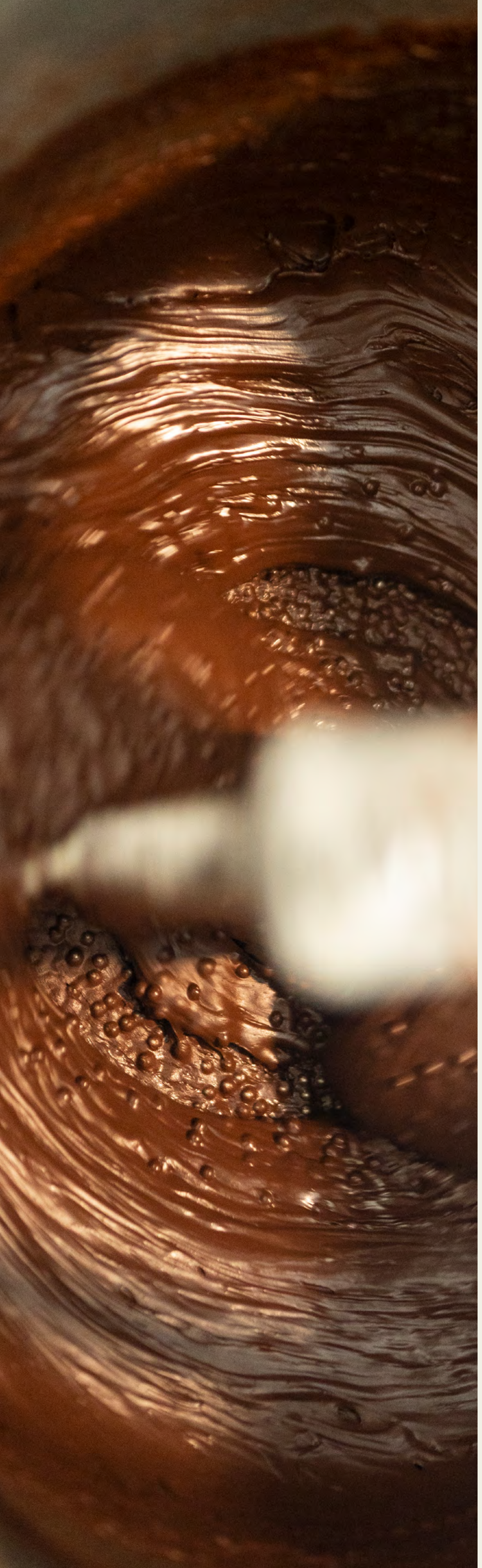
Leverage cooperation frameworks:
Utilize existing international cooperation instruments such as the EU-LAC Global Gateway and AL-INVEST Verde to channel funding and technical assistance toward building traceability infrastructure, data systems, and compliance support services in producer countries. These frameworks should be used strategically to co-finance digital platforms, satellite monitoring tools, and interoperability systems, as well as to strengthen institutional capacity. They can also facilitate dialogue between EU and Latin American stakeholders, fostering shared ownership of sustainable trade goals.

B

Support national implementation strategies:
Collaborate with partner governments to codevelop EUDR implementation roadmaps that align with national legal frameworks and institutional structures. This should include support for legislative reforms, stakeholder consultations, and the development of national guidelines. Capacity-building efforts should prioritize training for public officials, customs authorities, producer organizations, and local auditors to ensure that the regulation is applied consistently and effectively across jurisdictions.

C

Fund independent technical assistance:
Establish dedicated funding windows to support independent, on-the-ground technical assistance providers—such as NGOs, cooperatives, or advisory firms—who work directly with smallholder producers, Indigenous communities, and local enterprises. These grants or service contracts should enable outreach, training, field diagnostics, and support for compliance documentation (e.g., geolocation mapping, risk assessments). This approach helps bridge the gap between regulatory requirements and the practical realities faced by producers on the ground. Technical assistance can also include agricultural support. The study mentions that productivity varies among associations due to differences in agricultural practices. Governments can help by funding research into more resilient cocoa varieties or better farming practices that improve yields and reduce costs.



2.3.3. Facilitating Equitable Market Access

A

Create public reporting and benchmarking systems:
Establish transparent platforms where buyer due diligence practices, including sourcing policies, risk mitigation measures, and compliance outcomes, are publicly reported. This promotes accountability, allows for benchmarking across companies, and enables stakeholders to monitor progress and identify leaders and laggards.

B

Support aggregation and inclusion of smallholders:
Promote and fund cooperative models, producer organizations, and supply chain intermediaries that help smallholders access formal markets and comply with due diligence requirements. Aggregation can reduce costs, improve traceability, and increase bargaining power for small producers, helping them meet technical and administrative demands more effectively.

C

Incentivize pre-competitive collaboration:
Encourage and co-finance industry collaboration on shared tools and joint risk assessments. Supporting pre-competitive initiatives reduces duplication, speeds up implementation, and levels the playing field, particularly for smaller buyers or less-resourced sectors.

2.3.4. Diplomatic and Multilateral Engagement

D

Engage producing country governments in dialogue:
Foster structured, ongoing dialogue with producing country governments to co-design solutions that align EU regulatory goals with national development priorities. These discussions should aim to build trust, reduce regulatory friction, and identify areas for cooperation.

E

Promote global alignment:
Support the development and adoption of international frameworks and standards that harmonize sustainability, traceability, and due diligence requirements across markets. Global alignment reduces fragmentation, simplifies compliance for multinational supply chains, and strengthens collective impact against deforestation and environmental harm.

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Why we are here
To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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