AGRICULTURE AND DEFORESTATION

HOW TO REDUCE THE IMPACT OF THE EU'S AGRICULTURAL IMPORTS ON GLOBAL FORESTS

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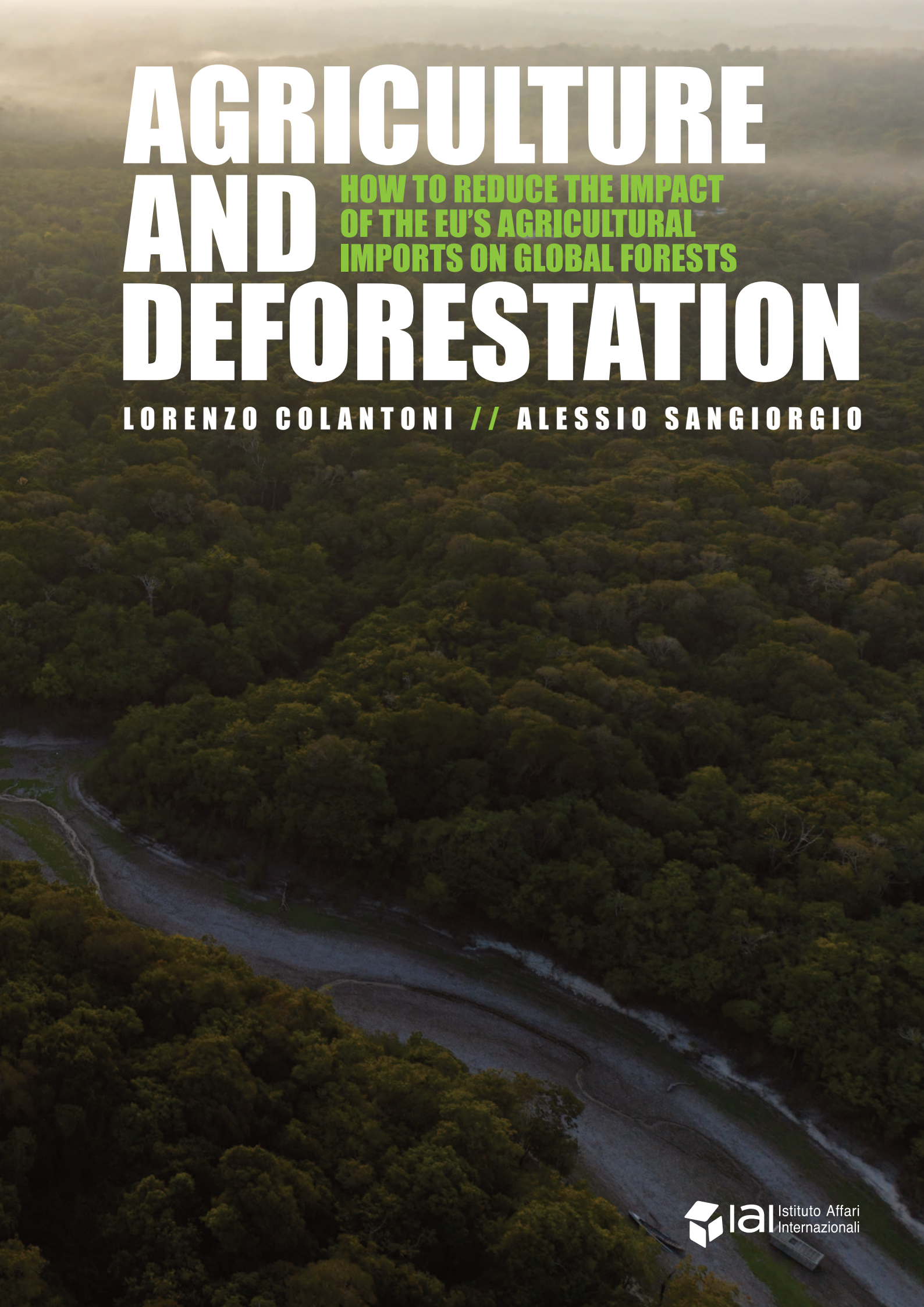

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Istituto Affari Internazionali

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Introduction

Agriculture is by far the leading cause of global deforestation, being responsible for over 90 per cent of all clearing.[1] And yet, while a number of initiatives and treaties have been developed over the decades to protect forests, no one has ever directly addressed agriculture. Above all, the international trade of agricultural commodities, which is the leading cause of deforestation within farming activities, has never been regulated. At a critical moment to face the biodiversity and climate crises, it is of utmost importance to address this issue.

The European Union is in a privileged position to improve this framework. Particularly after the launch of the Green Deal back in 2019, it is at the same time the most advanced player in terms of environmental regulation and the biggest importer of products that cause deforestation globally. It also has the expertise, the domestic political support and – no less important – the need to finally deliver a policy tool to address the impact of agricultural trade on global forests. And, to some extent, it has finally done so.

In May 2023 the EU finally adopted the EU Regulation for Deforestation-Free Products (EUDR), the most ambitious and encompassing instrument ever adopted to regulate the trade of agricultural commodities to make them sustainable for global forests. Building on the 20-year timber-trade experience of the Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan[2] and on the unique momentum of the von der Leyen Commission's extensive work on environmental issues, the EUDR would seem to have all the credentials to be successful.

Yet, despite this encouraging progress, there is no guarantee that the EUDR will reach its objective of importing only deforestation-free products into the EU. Supply chains are very convoluted and in dire need of more transparency. Certifications for commodities still cover a relatively small percentage of trade, and enforcement is often ineffective or inadequate. The EUDR itself is not without flaws – rather the opposite. While improving significantly over its predecessor the EU Timber Regulation (EUTR), many problems that characterised the approach of the former are still there – the penalisation of smallholders and inadequate resources for monitoring, among others. And there are new ones: the EUDR is largely a unilateral measure, which many trading partners have perceived as an imposition of EU rules (and then fiercely protested), while the colossal scope of the Regulation could result in a significant increase in costs for the European agrifood industry.

And yet, the EUDR must not fail. It is the first attempt at regulating a sector that, at least for commodities such as soy and palm oil, has imposed a huge toll on global forests and pushed many ecosystems beyond a no-return point. Time is running out to save some of the most important biomes in the world, from the Amazon to Borneo, and a failure of the EUDR will delay new efforts to regulate commodity trade from an environmental perspective. It could be then too late then to protect what remains of the world's most precious forests. An accurate implementation phase in which to include a few core changes, synergies with global climate and biodiversity policies, as well as the delivery of additional instruments to support players in the sector in this transition could be the key to achieving all of this.

« Borders of the Krueger National Park, South Africa

Acknowledgments

About this report

This report analyses the impact of EU agricultural imports on global forests, discussing and proposing technical, operative, policy and financial solutions to reduce this impact. It focuses on the seven commodities considered by the EUDR (cattle, cocoa, coffee, oil palm, rubber, soya and wood) and dedicates particular attention to the Regulation, both throughout the document and more specifically in section 3.4. The report is divided in three parts: an overview, detailing the magnitude of EU imports and comparing it to other players; a technological and operative chapter, focusing on solutions ranging from tracing and certifications to enforcement and best agricultural practices; and finally a policy and private sector chapter, dedicated to EU and non-EU policies and to financial options.

The report considers all trading partners of the EU globally, giving however specific attention to South-East Asia and South America, and to Indonesia and Brazil as main trading partners for agricultural commodities. This report has been produced also through extensive fieldwork in Indonesia and in Brazil, where the team conducted a series of interviews and visits focusing on both plantations and smallholders from the producing side, and on major and small buyers for a series of commodities – particularly coffee, palm oil, rubber and timber. Visits took place in the Indonesian provinces of South Sumatra, Lampung, Riau, West Java, East Java, East Kalimantan and Jakarta and in the Brazilian states of Sao Paulo, Minas Gerais, Pará and Amazonas, all between August and November 2023.

About IAI

The Istituto Affari Internazionali (IAI) is a private, independent non-profit think tank, founded in 1965 on the initiative of Altiero Spinelli. IAI seeks to promote awareness of international politics and to contribute to the advancement of European integration and multilateral cooperation, focusing on topics such as European integration, security and defence, energy and climate policies, as well as key regions such as the Mediterranean, the Middle East, Asia, Eurasia, Africa and the Americas. The IAI publishes an English-language quarterly (*The International Spectator*), an online webzine (*AffarInternazionali*), two book series (*Trends and Perspectives in International Politics* and *IAI Research Studies*) and other paper series related to IAI research projects.

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Executive Summary

OVERVIEW: THE ROLE OF AGRICULTURE, THE EU AND MAIN PLAYERS IN GLOBAL DEFORESTATION

Despite decades of global efforts to stop or reduce it, deforestation is still advancing at a rate that is destroying key ecosystems and is strongly affecting our efforts to fight climate change. Agriculture is the key driver behind deforestation, particularly when considering intensive land use and destructive practices – which are often associated with the commodities that are mostly traded on the international level. Indeed, seven commodities are responsible for most of the global deforestation; between 2011 and 2015, 58 per cent of total clearing was caused by cattle ranching, palm oil, soy, cocoa, rubber, coffee and wood products (paper, timber, etc.).[3] This has slightly changed in recent years, with rubber and palm oil reducing their impact on global forests, but price fluctuations and the growing demand of countries such as China and India for some of these commodities (palm oil in particular) could transform the situation again in the future.

Despite this bleak picture, no major efforts have been undertaken on the international level to address the impact of agriculture on deforestation. International programmes such as the REDD+[4] have focused only on protecting forests, disregarding the root causes behind the phenomenon. Insufficient funds, lack of power by international institutions and significant economic interests in both the producing and receiving countries for commodities have marked the failure or scarce success of these attempts.

The EU is now in a particularly strong position to kickstart efforts to regulate international trade of agricultural commodities in order to protect global forests. The bloc is one of the largest importers of agrifood products – 196 billion euros in 2022 – and a significant share is represented by commodities that have a high deforestation risk. Some member states have a particularly prominent role (Italy, Germany, France, Spain and the Netherlands among the most relevant), but the situation varies depending on the commodity. At the same time, environmental awareness in the EU has significantly increased in recent times and so has political support for ambitious environmental policies. This has been proven by the innovative vision of the European Green Deal and the long list of initiatives launched by the von der Leyen Commission, which also widely dealt with sectors once neglected by the European political debate, such as biodiversity and habitat protection.

The result of these factors is the EUDR, the first ever attempt to regulate international trade of agricultural commodities to protect global forests. The EU is trying to use its ability to regulate global markets (the so-called "Brussels

« Palm oil plantations, Sumatra, Indonesia

effect") to address the root cause of deforestation, in the same way it is doing also for decarbonisation (through measures such as the Carbon Border Adjustment Mechanism, the Taxonomy for Sustainable Activities and the EU Emission Trade System).

The EUDR has however a series of flaws that may undermine its success, and many of these issues will need to be addressed in its implementation phase to make this and future attempts successful, both from a technical and a political perspective.

TECHNICAL AND TECHNOLOGICAL SOLUTIONS

In order to curb the impact of its agricultural impacts on forests, the EU should first solve a series of technical issues that have undermined even the less ambitious attempts by civil society, international organisations, national governments and the private sector in the past. These problems range from understanding the best agricultural practices and delivering effective tracing solutions, to empowering enforcement agencies and smallholders.

The promotion of good, forest-positive agricultural practices is the starting point for the EU, but this is easier to say than to achieve. While a few principles are clear (avoiding land degradation, promoting efficient use of all resources, reducing monoculture as much as possible, etc.) it is impossible to find one-size-fits-all solutions not only applicable to different commodities, but sometimes even to the same commodity across different provinces of the same country. Agroforestry is particularly exemplifying: it is one of the most promoted techniques for the coexistence of forests and agriculture, but it has hundreds of variations and can be either sustainable or damaging to forests.

Traceability is equally fundamental and complicated – to some extent, even more so. A reliable understanding of the sustainable origin of commodities is the central legal requirement of the EUDR, but it is also the key element to give visibility to and thus promote forest-positive agricultural production. Effective tracing is however profoundly complicated because of how convoluted and opaque supply chains still are. The deep differences existing between the supply chains of diverse commodities and countries also contribute to such difficulty, since different methods will need to be delivered for each. The advance of digitalisation and new technologies, particularly apps and the use of GPS positioning with satellite images, is helping to quickly spread tracing methods and reducing costs, which are however still significant for sectors that have never implemented tracing. It will be then necessary to make sure that the costs are evenly distributed across the supply chains and not borne by the smallest or most fragile of these elements.

Certification schemes will be central to this process, but their landscape is varied and should be well-understood. Excluding the EUDR, certifications are the only existing attempt to regulate agricultural trade from a sustainability perspective, but they are voluntary and their success has been mixed. While some commodities benefit from more schemes that also cover a relatively large part of production (coffee, cocoa), others have virtually no working certifications (soy, beef). The EU will have to incorporate successful certification schemes in the EUDR implementation, while at the same time understanding why others have failed.

Enforcement will also play a relevant role, much more so than in the past. Law enforcement agencies, such as police forces or customs, have been involved in previous regulations such as the EUTR, but their role in protecting forests has been limited and so has been their impact. This will likely change in the future, particularly in the EU. The use of criminal law and greater administrative punishments against environmental crimes has received strong political support in recent years and deforestation has been one of the main topics debated. This has translated into environmental crimes being a top priority for the current EU Policy Cycle (2022–2027) as well as the recent approval of a revised Environmental Crime Directive that has a direct connection with the EUDR. In turn, this could lead to more police operations focused on monitoring trade, making use of bigger fines and sanctions that can also discourage violations and act thus as a preemptive measure. A new set of tools should be delivered from a technological, but also policy and social perspective, to exploit this momentum of enforcement.

The EU will also have to reconsider the narrative on smallholders, whose impact on global deforestation has often been misunderstood. Projects run under programmes such as the REDD+ or many certification schemes tend either to blame smallholders for much more than they are actually responsible for, or to overvalue their environmental awareness and respect for the forest. Nevertheless, benefits from supporting smallholders are clear, especially when associated to a well-defined land tenure. Indeed, especially when considering indigenous peoples, forests managed by local communities tend to be better protected and healthier. It will however be necessary to guide smallholders towards sustainable practices and include them in the law-making process (or, if it is too late, at least in the implementation phase) to make sure they are not disadvantaged and antagonised by environmental regulations – as, to some extent, is still the case for the EUDR.

POLICY AND FINANCIAL SOLUTIONS

An effective policy and financial framework will be needed for all these technical and technological solutions to work, and this is still missing to a large extent, at least on the international stage. The situation is however evolving; the

growing attention to climate action has had positive spillovers for forest protection and the recent COP28 has been the first ever climate conference to name the role of agriculture and the need to decrease its impact on a vkariety of ecosystems.[5] This has not yet translated into practical instruments or legislation, either on the global or the national level. The main (and perhaps only) UN tool to reduce deforestation is the REDD+, which is however mostly an aid measure focused on climate with little chance to make substantial changes to agricultural trade (and with limited effect so far). The only country that has come up with anything close to the EUDR is the US, which proposed the FOREST Act in 2021. The regulation is very close to the EUDR, but it has not been approved, and this is not likely to happen before the end of the current administration. China, India, Japan and all the other major consumers of agricultural commodities have not made any proposal in this sense yet.

The EUDR is thus a unique tool, with great ambition but many points that remain unclear. It builds on the structure and approach of the EUTR and of the FLEGT Action Plan, which were launched between 2003 and 2010 and only addressed timber trade. The EUDR expanded the focus of the EUTR to the seven commodities with the most impact on forests and imposed a strict rule: after its entry into application, expected in December 2024, no commodity that caused deforestation and has been produced against national legislation of the producing country can be imported to the EU.

Considering the absence of any other legislation dealing with the impact of agriculture on forests, this is an outstanding objective – and yet, one that will be complicated to achieve. The Regulation still does not address some of the critical points of its predecessor, such as how to effectively enforce it, or how to avoid forest negative commodities being produced anyway, and then sold to non-EU buyers. It also brings a set of new problems; the Regulation will have to deal with sectors that are often extremely different from each other and find a way in its implementation to address this heterogeneity, since the EUDR per se is a rather general piece of legislation. European buyers will have to implement traceability across all of their supply chain, often in sectors or countries where this has never been done before. In best-case scenarios this will be an expensive exercise; in others it could almost be impossible.

The implementation of the EUDR will indeed be a central moment to reduce the costs imposed by the Regulation on European buyers, and to distribute these expenses evenly. The entry into application of the Regulation will bear significant costs that could reduce the competitiveness of the European agrifood industry, or translate into price increases for European consumers. Smallholders could see their margins eroded because of tracing and other costs being passed through directly to them due to their low bargaining power, or they could lose ac-

cess to the EU market because EUDR compliance will be just too expensive for them. These problems could not only impose a significant burden on the players of the affected sectors, but ultimately discourage compliance and undermine the success of the Regulation.

However, even before its application, the EUDR is already causing trouble with the EU's most important suppliers. Brazil, Indonesia and 15 other countries have already protested against the Regulation, which they perceive as an imposition of European rules on which they had no say. The EUDR is to some extent also a measure for the EU to increase unilateral control over key agricultural imports, but antagonising its trading partners will not help achieve an effective implementation of the Regulation. This will require instead extensive cooperation with national authorities – as well as the private sector – which have been so far largely excluded from the debate.

The EUDR alone will not be enough to reach the EU's objective to curb deforestation; addressing finance will be fundamental. Supply chains are convoluted, but financial flows directed to the agricultural sector are equally if not more so. This has led even institutions with a solid sustainable mandate to sometimes funnel investments towards high deforestation risk projects, which have in most cases a relatively easy access to funds anyway. A more regulated international finance is thus needed to reduce investments towards unsustainable projects or at least to increase the costs for high deforestation risk activities. In addition to this, new green finance is also fundamental, ideally not just under the umbrella of the now fast-developing climate finance, but also with a specific agricultural or forest-related scope. Above all, it will be central to derisk sustainable agricultural supply chains, which still bear a significant risk premium, so as to guarantee the profitability and competitiveness of forest-positive production.

It will be also fundamental to find a new, balanced role for the private sector in this shift of global agriculture. The REDD+ has faced strong difficulties in integrating the private sector in the programme, and the EUDR gives significant responsibility to it but has involved private players very little in the legislative and (so far) implementation processes. Yet, companies have the best understanding and the strongest hold on supply chains, and their active involvement would definitely improve the complex application of the EUDR and of other legislation. Tools to improve this cooperation are now appearing on the global stage: public-private partnerships on sustainable agriculture are getting on track and fully private ones are also appearing, such as the Natural Capital Investment Alliance (NCIA). The inclusion of the private sector in carbon markets is also another positive advancement, but more should be done for this cooperation to be integrated even when designing policies and programmes.

Policy recommendations

ONE-SIZE-FITS-ALL SOLUTIONS ARE TEMPTING, BUT ARE NOT LIKELY TO WORK

The EU has the difficult task of regulating a multifaceted sector with strong differences among countries and commodities, without any previous attempts made in this sense. Adopting general solutions that will then be differently translated into practice by the operators of each commodity is an easy way to deal with this likely unbearable complexity, but it is not a recipe for success and will likely result in ineffective measures and uneven distribution of costs. The EU should instead focus on more ad hoc solutions in the phase of EUDR implementation, at least for critical commodities (such as palm oil) and suppliers (Brazil and Indonesia). This is valid across all areas: from best agricultural practices (more on this in section 2.1) to traceability (2.2) and finance (3.6).

TRACEABILITY IS THE KEY QUESTION, BUT ONLY A MIX OF SOLUTIONS WILL BE THE ANSWER

The attempt to regulate agricultural trade relies ultimately on achieving effective traceability: cheap, reliable and easy to implement across supply chains. Certain solutions are sometimes presented as a panacea for tracing, particularly technological ones, such as satellite imagery and apps. Yet, only a mix of economic, social, technical and even political tools will prove effective: without adequate economic incentives farmers could turn to tricking the geolocalisation system, while a reluctant administration can make the deployment of these schemes very complicated. Tracing requires instead a whole approach that takes into account different factors and different steps in the supply chain (section 2.2).

CERTIFICATIONS ARE KEY

Sectors and regions that have already solid experience with certification, such as coffee production in the Brazilian state of Minas Gerais, are the readiest to receive the EUDR and compliance will not represent a major cost for operators dealing with them. On the other hand, this will be very complicated and expensive for sectors where certifications have been difficult to deploy (palm oil) or have had very scarce success so far (beef). The EU will have to take into consideration this significant gap in the implemen-

tation of the EUDR and other policies, by integrating successful certifications as much as possible in the process, and giving more flexibility to sectors and areas where they are still absent. EU institutions will also have to differentiate among schemes; while some are solid and have proved to be trustworthy, others have offered little guarantee to reduce deforestation (particularly some run by national administrations) (section 2.3).

DO NOT UNDERESTIMATE THE ROLE OF ENFORCEMENT AND THE POSSIBILITY OF USING CRIMINAL LAW

Enforcement is key for the success of forest governance and regulating trade. Even in countries that have a solid legislative framework, such as Brazil, it is the strength and reliability of enforcement that ultimately determine the success of policies. Yet, even in the EUDR there is not yet an effective solution to bridge the complexity of enforcing cross-border rules, with a variety of negative effects on the Regulation: many producers and operators doubt it will be truly applied, penalising its deterrent effect, while the work of competent authorities will be likely even more complicated than already was true for the EUTR. It will be key to deliver coordination instruments that will allow for cooperation not only within Europe, but with trading partners' authorities (section 2.4). As economic interests are huge and the power of many operators great, it will be also central to use much more powerful tools than what has been applied in the past; the revised Environmental Crime Directive will be crucial for this (section 3.3).

CHANGE THE NARRATIVE FOR SMALLHOLDERS

When it comes to regulating agricultural trade, smallholders are in a complicated limbo. Some policies support them, but at the same time blame them for a share of deforestation that is much higher than their actual contribution (section 2.5). Others, including the EUDR, do not give them enough consideration and safeguards, and risk having the same negative impact the EUTR had on smallholders in the past (section 3.4). More generally, the narrative swerves from a sanctification to a demonisation of small-

holders, while a much more balanced approach is instead required, admitting the limitations and often lack of awareness of many, but also the significantly positive contribution they can give to the work of the EU and other institutions (section 2.5). Furthermore, despite a tendency to generalisation, not all smallholders are the same; they differ in size (coffee smallholders in Brazil own some 10–20 hectares, in Indonesia less than two), in attitude to change, in the availability of capacity building and other tools, or in access to markets. Taking into consideration these often significant differences is fundamental for a proper involvement of smallholders.

GIVE THE PRIVATE SECTOR A NEW ROLE, AND NEW TOOLS

The private sector has historically had an ambiguous (and small) role in past attempts to regulate agricultural trade and reduce deforestation. It has been considered at the same time a player to be involved in policies such as the REDD+ and an adversary that should not be trusted, leading to inadequate incentives for inclusion. It is however now clear that the private sector must play a relevant role in new policies if we want them to be successful: regulations such as the EUDR are just too complicated and have too much of an impact on the EU agrifood industry to continue with one-sided measures, operators being also the best expert on their own supply chains (section 3.6). Yet, on the EU side the attitude towards the private sector has changed only to a limited extent; it will be central instead to integrate it more in the EUDR, particularly adopting a series of new policy and financial tools that have proved effective in recent times (section 3.7 and 3.8).

DEAL WITH FINANCE THE WAY SUPPLY CHAINS WILL BE DEALT WITH

Supply chains are opaque and convoluted, but so are the financial flows driving agricultural activities. Even some of the most reliable funds have been proven to sponsor high deforestation risk projects (section 4.1), despite commitments and often without the knowledge of the institution. While it is the demand for agricultural commodities that drives the expansion of

farmland to the detriment of forests, it is the availability of investments that makes it possible. Controlling the demand side of trade is crucial, but restricting financial flows to companies and projects that present a high risk of deforestation could prevent forest clearing from happening in the first place. Yet, the financial aspect is completely disregarded in the EUDR; it will be instead essential to address it by exploiting the new climate and green financial tools that are now being deployed on both the EU and the global level (section 3.6).

EXPLORE SYNERGIES, BUT KEEP FOCUSING ON AGRICULTURE

Much is happening on the European and global stage that could support policies such as the EUDR, from the constant evolution of climate action to attempts by countries such as China and the US to stop illegal logging and reduce deforestation. It will be important to explore the economic, financial and political interactions of the EUDR with these policy developments, to maximise the reach of the Regulation and the tools available for it. However, it will be equally important to keep developing tools that focus first and foremost on agriculture: one of the issues that has prevented effective action against deforestation and forest degradation in the past has been the lack of focus on farming as the main driver behind forest clearing, a role that has until now been only indirectly recognised. The EUDR is the first policy to directly address agricultural commodities, but it should not remain the only one: more financial and policy tools must be developed at all levels – the EU, the UN, individual countries – to support forest-positive agriculture and penalise high-risk activities (section 3.4).

1. OVERVIEW

THE ROLE OF AGRICULTURE, THE EU AND MAIN PLAYERS IN GLOBAL DEFORESTATION

1.1 AGRICULTURE AS THE MAIN DRIVER OF DEFORESTATION, AND REGIONAL DIFFERENCES

The impact of agriculture on forests

Forests constitute a vital resource for the world's efforts to curb climate change and achieve its sustainability goals. They represent the vital ecosystem for most of the global land-based biodiversity and they act as effective carbon sinks, holding a carbon stock of 662 billion metric tonnes in 2020.[6] However, their destruction and degradation continue at a high rate, with deep consequences for local communities and the global economy. In 2022, the global loss of forests amounted to approximately 6.6 million hectares (Mha), marking a 4 per cent increase in deforestation compared to 2021.[7] Agriculture, especially when intensive land use exploits destructive forestry practices, has been the main driver of deforestation, being responsible for the loss of over 420 Mha between 1990 and 2020.[8] he conversion of forests for other land uses is particularly severe in the tropical and sub-tropical regions, in particular within the Amazon Basin in South America, the forests of Southeast Asia and Congo Basin in central Africa. These regions are largely different from an environmental, socio-economic and cultural perspective, but they share common problems related to agricultural land use.

Brazil, for example, has seen the largest share of deforestation with 2.34 Mha lost in 2022 alone, an area four times larger than the whole London Metropolitan Area.[9] Since the 1980s, agriculture has expanded by 172 per cent and pasture land use has grown by 46 per cent, endangering forests' integrity in biomes like the Amazon and the Atlantic Forest.[10] Similar issues have been observed in Indonesia[11], which has suffered from heavy deforestation in the past 20 years that, despite slowing down, continues to this day.[12] Palm oil monoculture and intensive logging have been responsible overall for almost 40 per cent of deforestation in the country.[13] While a part of this was legal, the majority was due to illegal practices bolstered by inadequate checks and monitoring.

Weak enforcement is amplified by corruption and political instability. Regions with extremely low governance see uncontrolled exploitation of forest resources and may lack political will and capacity to stop it. Deforestation in the Democratic Republic of the Congo, for example, has been calculated between 0.51 and 1 Mha.[14] Deforestation has been caused partially by livelihood-driven clearing, where extreme poverty conditions push people to clear forests to satisfy food and energy needs, but mostly by shifting agriculture to produce commodities destined to foreign markets, including Europe.[15]

1.1.1 International agricultural supply chains and destructive practices

Deforestation externalities of agricultural supply chains have been propelled by the intensification of farming practices aimed at meeting the increasing demand

« A domesticated elephant in Sumatra, Indonesia.

for food and raw materials. This situation is set to worsen: global demand for agricultural products is projected to increase up to 56 per cent by 2050 because of growing population and changing dietary trends.[16]

Different impacts of commodities and techniques

Different agricultural commodities are linked to various degrees of environmental impact. Other than pasture expansion, oil palm and soy cultivation are the main agricultural commodities that drive deforestation; alongside rubber, cocoa and coffee they are responsible for up to 90 per cent of agricultural-driven deforestation.[17] Among other commodities, timber, rice, maize and cassava have played a significant role in expanding agricultural land use.[18]

The complexity of supply chains

The high level of complexity in international supply chains has expanded the reach of agricultural-driven deforestation and has increasingly locked producers, buyers and national governments into destructive practices. In this context, agricultural commodities markets have often been highly volatile, exposing producers to cyclical rising and falling prices, making them sometimes reluctant to incorporate added costs linked with sustainability practices. Furthermore, commodities produced with these practices do not necessarily receive financial incentives or subsidies expressly directed to avoid negative externalities such as deforestation. On the other hand, a significant portion of the buyers are not incorporating these increased costs, with many consumers ignoring the products' origin and related sustainability, instead exclusively responding to price signalling. This dynamic generates a situation in which deforestation-free agricultural commodities are more expensive to farm, but producers often do not have the assurance of attracting new demand or receiving preferential treatment in specific markets – all promoting again the use of cheap and destructive practices.[19]

1.1.2 Consequences of agricultural-driven deforestation

Destructive practices

Destructive practices are used to produce commodities on a large scale and with low costs, often without any form of reparation for the natural environment. These methods frequently cause lasting damage to forest areas not only directly, converting land use to intensive agriculture, but also in terms of indirect soil degradation. Destructive practices often generate spillover effects. Agricultural expansion may impact the ability of the land to cope with heavy rains and absorb water, leading to more severe floods. Intensive agriculture also poses a risk for biodiversity, which is deeply threatened by pesticide contamination of the land and the water sources, beyond than the destruction of natural habitats for local species. For example, the Brazilian Cerrado, covering 200 million hectares of forest and savanna, is among the most biodiverse areas of the world, but it has witnessed an increasing risk to its ecosystem integrity, and its proper functioning is not just key for biodiversity preservation, but also for local agriculture. Indeed, the Cerrado ecosystems offer essential services like pollination, pest management and nu-

trient recycling, which are fundamental for sustainable farming; deforestation in such areas initiates instead a harmful loop where biodiversity loss adversely affects agricultural efficiency, leading to decreased farm yields. This drop in output compels producers to increase farmlands to sustain production levels, often causing more deforestation. Increased forest loss, combined with other environmental problems such as soil degradation, disruption of the water cycle and higher carbon emissions, in turn intensifies the loss of biodiversity, aggravating the cycle.

Devastation with no impact on productivity

Furthermore, the deforestation caused by agricultural activities does not necessarily lead to an expansion in farmland productivity or an increase in exported volumes. Often, it is the result of practices like speculative land clearing, unresolved land ownership disputes, or short-lived and abandoned farming operations. For instance, a strategy to expand agriculture land used by large producers is to engage in illegal large deforestation processes (e.g., through fires), with the intention of later grabbing the land, or leasing the cleared land, for monoculture production. The use of fires for agricultural purposes poses a high risk, as they can extend to neighbouring forests uncontrollably. For example, illegal fires to clear land were identified as the main cause of the 2015 Indonesian fire crisis, when 2.6 Mha of land burned in few months. In the same year illegal palm oil cultivation was observed in the affected area, even if no concession was awarded, further consolidating the link between forest fires and agricultural-driven deforestation.[20] Ten palm oil producers, both local and foreign firms, were eventually found guilty of being involved in fires both in their concessions and in other protected forested areas.[21] [22]

1.1.3 The role of the EU: Trends and prospects

In 2022, the EU imported a total value of 196 billion euros in agricultural commodities. These imports include vegetable products (39 per cent of imports), various types of processed foods (32 per cent), animal products (19 per cent) and fats and oils, both vegetal and animal (9 per cent).[23] The large share of unprocessed food, such as soy, palm oil, coffee, cocoa, beef and rubber, is the main cause of deforestation; however, processed foods also often contain as ingredients other deforestation-embedded products, in particular palm oil and soy, making the EU's contribution on deforestation through its agricultural imports difficult to quantify with any precision.

According to estimates, the EU bears responsibility for a quota of global deforestation between 10 and 16 per cent, with Germany, Italy, Spain, the UK, the Netherlands, France, Belgium and Poland being responsible for 80 per cent of the EU's embedded deforestation.[24] Two of the main EU trade partners for agricultural commodities, Brazil and Indonesia, together represent almost 600 million hectares of forest and account for the largest share of deforestation imports. Brazil is the first EU trading partner for agricultural products by economic value,

with 10 per cent of imports coming from the country and an estimated value of €20 billion, while Indonesia is the largest origin for EU vegetal fat and oil imports with a quota of 16 per cent and a value of €3 billion.[25]

Seven key commodities

The European Commission has estimated that 73 per cent of global deforestation is linked with the expansion of production of seven commodities: palm oil, soybeans, cocoa, coffee, rubber, beef and timber, which are in high demand on the European market.[26] About a fifth of deforestation in its trade partners has been a consequence of European imports of these commodities, and the risk of agricultural-driven deforestation in these trade partners is increasing as European demand for deforestation-embedded commodities grows.[27] The European Commission has also projected that the global output and exportation of these internationally traded agricultural commodities are expected to rise in the upcoming years.[28] It has indicated that while the EU's consumption of these commodities will level off for certain products, like cattle and soy, it may significantly increase for others, such as palm oil, cocoa and coffee.[29] While food consumption may grow marginally in the EU, other projections show that by 2032 arable crops may decrease in Europe, further increasing dependence on large agricultural exporters.[30]

Without a fair and environmentally conscious trade policy, this could put European buyers at higher risk of causing deforestation with their imports. Indeed, the EU forecasts suggest that, in the absence of new policy interventions and the development of effective solutions, deforestation linked to EU imports of deforestation-embedded commodities is set to grow, with an estimated deforestation footprint of the EU in the range of 300,000 to 600,000 hectares annually by the year 2030.[31]

1.1.4 The scale of deforestation-embedded commodities in the main member states

Despite a clear role of the EU bloc in this process, the full impact is best understood through an analysis of the role of each member state as they showcase very different trade patterns. European countries exhibit unique trade balances and dynamics, shaped by their size, their national industries and the bilateral relationship with exporting partners.

Beef, cocoa, soy, palm oil

Focusing on major agricultural commodities, Italy emerges as the largest importer of beef, accounting for 57 per cent of the bloc's total imports.[32] Beef is closely linked with deforestation due to its association with pastureland expansion, especially in South America, with Argentina, Brazil and Uruguay being the largest trade partners of European countries. Concurrently, domestic production of beef in main European producers (France, Germany and Italy) is falling, while demand is projected to grow.[33] These elements may further drive deforestation by increasing imports in member states with already high demand, such as Italy and the Netherlands.[34] The Netherlands stands out also in other deforestation-

embedded commodities trade, ranking first among EU countries when it comes to imports of cocoa (42 per cent) and soy (23 per cent).[35] Cocoa imports are very relevant in many member states, as some of the largest chocolate manufacturers in the world operate in Germany, the Netherlands, Italy and Belgium. Portugal and Spain, both major producers of meat, are significant importers of soy, primarily used for livestock feed. Following the Netherlands, they rank as the second and third largest importers respectively.[36] Contrary to beef, soy and cocoa, where demand has increased in almost all European countries, palm oil saw a noteworthy decline in many member states markets, dropping respectively by 38 and 42 per cent in Belgium's and Italy's import levels compared to 2021. Palm oil imports declined in the Netherlands by about 19 per cent, with Spain overtaking as the largest importer with around 1.3 million tonnes.[37]

Rubber

Rubber plays a crucial role in tire production for the automotive industry, and member states with robust automotive sectors are indeed the primary importers of natural rubber. In 2021, Germany imported 593 million euros worth in volumes of natural rubber, followed by Italy (372 million euros), Spain (290) and France (265).[38] The synthetic rubber market is increasing, but it has still not entirely substituted for natural rubber imports from countries with intensive production, such as Thailand and Indonesia.[39]

Timber

Finally, EU countries show a uniform distribution for timber imports, with Germany, Finland, Sweden, Italy and the Netherlands each contributing around 10 per cent of total EU imports.[40]

1.1.5 Sharing responsibility: Intra-EU trade and imports of processed foods

Intra-EU trade

Italy, Germany, the Netherlands and Belgium have been identified in the previous sections as the main importers of deforestation-embedded agricultural commodities. However, their imports are not directed exclusively to their own domestic markets; they also play a role as hubs for re-exporting to other EU member states. These countries are key entry points for agricultural commodities into the EU, with some goods being re-exported relatively soon after, and others undergoing processing before being re-exported. Intra-EU trade of processed foods complicates understanding each country's responsibility for deforestation driven by agricultural imports. For instance, the Netherlands, which is the world's largest importer of cocoa beans, also boasts the largest cocoa grinding industry and is Europe's biggest cocoa bean exporter. Therefore, different member states without direct sourcing capabilities predominantly acquire their chocolate and cocoa beans from within the EU.[41]

An European Commission study on agri-food supply chains has suggested that a new trend may be emerging towards shortening supply chains, which could

prompt other member states to increase direct sourcing of agricultural commodities from producing countries.[42] However, a potential increase in direct imports from producers rather than relying on intra-EU re-exporting does not offer identifiable positive or negative impacts on deforestation.

Already processed commodities

Additionally, the sourcing of already processed agriculture products remains a challenge in terms of effective traceability of origins and tracking of destructive practices along the supply chains. For example, the EU imports around 15 per cent of its processed agricultural products from the US, whose regulatory framework does not require any control for deforestation externalities of the raw commodities it originally imported.[43] Similar dynamics are consistent with other large exporters of processed foods towards the EU, like the Ivory Coast, Turkey, Malaysia, Thailand and especially China, which in turn is among the largest importers of agricultural commodities from high deforestation risk areas.

1.2 COMPARATIVE ANALYSIS BETWEEN THE EU, UNITED STATES, CHINA, JAPAN AND INDIA

Despite the significant role of the EU in global agriculture-driven deforestation, China is indeed the largest importer of forest-negative commodities, with 24 per cent of import-driven deforestation. The EU follows with 16 per cent, then India (9 per cent), the United States (7 per cent) and Japan (5 per cent).[44]

1.2.1 The role of China

Different trends in Chinese demand

China's role in agricultural supply chains has been a consequence of its booming population and expanding economy. China's demand for agricultural items from forest-rich regions is however now evolving, slowing down for some products while increasing for others. While still being the respectively largest and second-largest soybean and palm oil importer in the world, the demand for these products has remained stable in recent years, indicating a possible future reduction of its impact on global deforestation.[45] On the other hand, meat consumption in China has grown as a result of increasing personal wealth, leading to a 42 per cent rise in the value of beef imports between 2021 and 2022.[46] Brazil has covered 25 per cent of the trade flow of beef to the country, with other producers in North and South America being mostly responsible for the remaining quota.[47]

China also imports a significant volume of commodities linked to deforestation from Southeast Asia, driven by its high demand for rubber and palm oil. It is the world's largest importer of natural rubber and the second-largest importer of palm oil.[48] Coffee and cocoa play relatively smaller roles in the Chinese market, with the country being respectively the 16th and 25th largest importer of these two commodities.[49]

No change in recent years

While China is considering political action against deforestation and the role its agricultural imports have on global forests (discussed below in section 3), no decline has been observed in imports of high-deforestation risk timber or other agricultural commodities since the adoption of the Forest Law in 2019.[50] On the contrary, the China Oil and Foodstuffs Corporation (Cofco), the main state-run company in the agriculture sector, has been accused of violations of its own commitments on sustainability and deforestation, including its Supplier Code of Conduct and Sustainable Sourcing Policies for soy and palm oil.[51] Cofco suppliers operating in Brazil have also been fined and listed for violations related to deforestation by the Brazilian Federal Environmental Agency (IBEMA).

1.2.2 The role of the US

Imports vs domestic production

The United States imports large quantities of rubber and palm oil, comparable in quantity to Chinese and European imports. In 2022, the US was the second and fifth largest importer of these products.[52] The US also imports more coffee beans than any other country, being outranked only by the EU as a bloc.[53] Differently from China and the EU, the US has a strong national production of soy and bovine meat, decreasing the necessity for imports.[54] However, the US production of these agricultural commodities has caused a high level of domestic deforestation. Since the 1980s shifting agricultural land use and pastureland expansion have led to a decline of almost 55 per cent of forested areas in the US.[55] The US has yet to tackle the issue: a proposal for the Forest Act has been introduced to the Senate, but it faces obstacles in its confirmation due to a lack of widespread support (see section 3).[56]

Exports to the EU and China

Many of the commodities produced in these once-forested areas are now mainly exported to China and the EU. In particular, the large volume of goods traded with China triggered discussions in the context of the 2018 trade dispute between the two countries. Because of trade tensions and the use of tariffs, US soybeans exports to China fell drastically from 62 per cent in 2017 to 18 per cent just one year later.[57] The following Phase One Agreement[58] has eased Chinese and American trade relations, but trade balance considerations still overshadow sustainability issues. Consequently, even if agricultural supply chains are at the centre of discussion among these players, deforestation issues are scarcely addressed.

1.2.3 Other large importers: India, Japan, South Korea and the United Kingdom

India

Although less in total share of global imports, the role of other major importers, like India, Japan, South Korea and the United Kingdom, has a significant impact on deforestation particularly in tropical regions. India, the world's largest importer of palm oil and a major importer of rubber, primarily sources these commodities from countries like Thailand, Indonesia and Malaysia.[59] Imports of raw soybeans are limited in India, due to high tariffs, but the country is the largest importer of soybeans oil in the world.[60] In 2022, it sourced 1.4 million tonnes of

soybean oil from Brazil[61]; the conflict in Ukraine may even drive up India's demand not only for soybean oil, but also for palm oil, to compensate for the shortfall in sunflower oil, which is usually sourced from either Russia or Ukraine.[62] Furthermore, factors such as increasing incomes, urbanisation, and a growing population are anticipated to lead to a rise in the country's food demand, increasing the need for agricultural imports.[63]

Japan

Japan, with a relatively large population and limited domestic land for farming, has had to resort to large imports to meet food demand over the years; in 2022 the country imported roughly $70.2 billion in agricultural products.[64] Similarly to China, it is a large importer of soybeans, sourced primarily from the US and Brazil. Japan also imports large quantities of natural rubber, used in its automotive industry.[65] The country, however, displays a lower demand for other forest-risk commodities and its import volumes have not drastically increased in the past decades, partly because of the country's stagnant demography.[66]

South Korea

South Korea is on a similar trajectory; with less than a quarter of its area used for domestic production, it relies heavily on agricultural imports.[67] In 2022, the country imported agricultural goods valued at approximately $41.1 billion.[68] Specifically, beef imports from North and South America hit their highest volume ever in the same year, for a total of 477,000 tonnes.[69]

UK

The United Kingdom is another large importer of agricultural commodities; the main trade partner of the UK is the EU, but since Brexit in 2020, the country has expanded its importing sources.[70] Brazil's agricultural export revenues to the UK have risen by more than 1 billion USD since Brexit, in particular covering the UK demand for soybeans and coffee beans.[71]

2. TECHNICAL AND OPERATIVE SOLUTIONS

The first step to reduce the impact of the EU's agricultural imports on forests lies in understanding which technical and operative measures would work best for the purpose. It is a complicated task due to the extent of the commodities to be considered, the differences in their production and trade, the intricacy of global markets and the low readiness of many sectors and players for the shift towards forest-positive solutions. The EU will have to understand which sustainable practices and measures guarantee the lowest impact of agriculture on forests (and bring the greatest benefits to local communities), which monitoring and tracing tools would work best in order to understand the real origin and impact of production (and which will be less expensive for producers to implement), while also considering how to empower enforcement and protect smallholders.

This section aims thus at highlighting the most relevant methods and tools that the policies discussed in section 3 should support, focusing on best agricultural practices, on traceability methods, on standards and certifications, on new instruments for enforcement and on support for communities and smallholders.

2.1 BEST AGRICULTURAL PRACTICES

The fundamentals of sustainable agriculture

Sustainable agriculture should achieve three main targets: avoid further deforestation through conversion into agricultural land, minimise the indirect impact of production on forests (such as the dispersion of chemicals) and restore degraded land to the extent possible. More in detail, agriculture should respect a few core principles, such as avoiding monoculture, limiting the use of fertilisers and pesticides and monitoring possible contamination of surrounding ecosystems via wastewater. It should also promote a correct management of water resources, avoiding competition between irrigation and natural uses. The adoption of specific techniques (crop rotation) or the avoidance of others (slash and burn) is relevant, particularly for certain crops, but overall it is key to exclude any practice that could lead to land and soil degradation. Efficiency is also important, since higher production is usually (even if not always) linked to a decrease in the demand for agricultural land.[72] This can happen because inefficient production in areas where land is cheap or easily available often just leads to the clearing of more land to raise yields, rather than implementing new techniques.

However, aside from these general rules, sustainable practices can vary a lot when considering different commodities, countries and different interpretations of the same methods. This variability often results in significant uncertainty on what new tools to adopt or support. It also complicates the implementation of wide-ranging regulations, such as the EUDR, because it is virtually impossible to determine all the specific sustainability requirements for the commodities

« Natural forest in Tapajos, Parà State, Brazil

One size does not fit all

covered by the legislation, given their differences and complexity. Therefore regulations such as the EUDR or the US Lacey Act often rely on rather generic approaches (e.g., the EUTR and EUDR's "due diligence"), which in turn complicates the work of players in the sector by requiring them to understand and translate the general vision underlined by the legislation into a list of concrete practices. The lack of a precise and coherent approach also undermines the trust farmers have in the players that are trying to spread new, sustainable methods (such as institutions, NGOs or buyers). While these are often perceived as experimental, unreliable or just too expensive, the situation is also complicated by a limited attitude to change among many farmers.[73]

While it is key to rely on shared principles for what is considered sustainable, it is also important to consider the specific geographic, climatic but also social and economic features of each territory in the application of different practices.

2.1.1 Agroforestry

Among all practices, agroforestry deserves a specific mention since it is one of the most common, deep-rooted and effective in supporting the coexistence between agriculture and forests, and one of the most cited across programmes and regulations.

The variety of agroforestry

While some 100 different kinds of agroforestry are globally adopted,[74] the technique is usually considered as the combination of crops and trees or other woody perennials (shrubs, bamboo, palms) in the same plot.[75] Agroforestry is a set of often ancient methods that have gained new importance as an alternative to intensive agriculture, and that can translate into a variety of different approaches: agroforestry could mean growing suitable crops in natural forests, but it can also consist in adding trees and shrubs to agricultural land. Trees could belong to productive species (rubber and fruit trees)[76] or even to non-productive, endemic or endangered species. Overall, effective and sustainable agroforestry relies on an equal balance between the agricultural and the forestry sides, so as to obtain a satisfactory level of production and a healthy, functioning ecosystem. Benefits are many: agroforestry strongly supports the reduction of CO_2 emissions through carbon sequestration, conservation and substitution[77]; it is a key measure to improve biodiversity conservation by providing new habitats and by reducing the impact on surrounding ecosystems; and managed forests often represent valid "buffer zones" to protect natural forests from encroachment. The economic argument is also strong: not only do productive trees offer a good solution for crop diversification, but the ecosystem services and the non-timber forest products that come from agroforestry could also become relevant sources of income for farmers.[78] The prevention of soil erosion and degradation, as well as the preservation of water resources, constitutes another direct benefit of agroforestry. Not by chance, the practice is considered one of the most interesting for land regen-

eration: out of the 2.2 billion ha that the Food and Agriculture Organization (FAO) identified as available for restoration globally in 2022, the agency determined that some 1.5 billion could be well suited to agroforestry.[79]

Limitations of agroforestry

Despite all these advantages and the relative diffusion of the practice, agroforestry still requires scaling up and research. While the productivity advantages are generally well recognised, one-size-fits-all solutions are rarely applicable and different landscapes usually require different methods.[80] More than following a detailed set of rules, techniques should actually adapt to a series of variables, most of them of a local nature (climate, population density, local and export markets, for instance).[81] Similarly, even if long- and medium-term profitability can usually be expected, in the short term the situation is more complex: transition costs and the volatility of commodity prices can deter farmers from switching from intensive agriculture to agroforestry, since the technique works on time horizons that do not match those of global markets.[82] In areas dominated by intensive agriculture or where agroforestry has never existed or has been long since abandoned, farmers will require significant technical and often economic support to transition. Lastly, in terms of impacting forest degradation, the technique should not be used to justify the conversion of natural forests, rather to improve the health of areas that have already been degraded.

2.2 TRACEABILITY

While shifting to sustainable agriculture is already complicated, tracing the sustainable or unsustainable origin of agricultural commodities is equally problematic – if not more so. The difficulty of the process is increased by several factors, the most relevant being the supply chain length, the number of intermediaries involved, the structure of production and the readiness of the commodity for implementation of tracing processes. International trade is indeed substantially more complicated to monitor than intra-EU exchanges, also because of the lack of common procedures and of information exchange between national and international authorities and private players. This is a problem that has been key in undermining the EUTR[83] and could represent a significant issue for the EUDR as well.

2.2.1 Market structure

Role of intermediaries

Intermediaries play a central role in the monitoring and tracing of production of all commodities, but the market structure can vary not only across regions and among commodities, but even within the same country: in the case of coffee in Indonesia, for instance, international traders buy from major national companies which, in turn, purchase from local buyers who collect coffee from smallholders.[84] However, local buyers can be medium or large in size, and thus gather coffee from thousands of farmers, or can be very small – thus representing only a few

dozen farmers. Tracing can be easier for major buyers, but complicated or even impossible for small ones. Generally speaking, indirect sourcing represents the most common choice for international traders, with some commodities (cocoa and live cattle in particular) being virtually totally sourced in this way.[85]

Structure of production

The structure of production varies among commodities as well as among countries, further complicating the tracing process: even if, as of 2018, 64 per cent of Indonesian palm oil was handled by only four companies,[86] production was divided between large plantations with a single owner and cooperatives owned by local communities or even smallholders (who, in 2018, represented 30 per cent of production). Finally, some commodities are easier to trace than others. This often depends on how much attention customers and institutions have given to social and environmental sustainability in their production in past years: the impact of coffee on the environment has been widely debated on the global level in the past two decades and now the commodity benefits from an extensive list of certification schemes, covering some 30 per cent of total production in 2022.[87] Other commodities have received significantly less attention, such as rubber which mostly counts on the existing FSC[88] and PEFC[89] schemes that encompass only a portion of production.

2.2.2 Methods and importance of tracing

Tracing is a fundamental step in reducing the footprint of agriculture on forests – and, in the case of the EUDR, it is one of the key due diligence obligations.[90] Without effective tracing, it is impossible for international buyers to make a reliable distinction between sustainable and unsustainable producers. This blurred context in turn makes the enforcement of regulations impractical and disincentivises sustainable producers. On the other hand, effective tracing also increases the availability of data, thus improving the understanding of the impact of agriculture and of the trade in agricultural commodities.

Chain of custody

Tracing requires a complete overview of all the different steps of the supply chain including how the commodity is traded from one operator to other – a process usually called the "chain of custody".[91] It requires a reliable knowledge of the producer and of all the traders and operators up to the placement of the goods on the EU market. Effective tracing can be achieved by the collection of information through a series of tools that should be reliable and coherent across the whole supply chain, as well as easy to use by the different players – whether large or small operators. Digitisation is key for this process, particularly thanks to the recent development of apps that can be used by all players – farmers, small and large traders, etc. – directly through their smartphones. While virtually all tracing methods for agricultural commodities are now digital, it is also key that data be digitised at the moment of collection to improve their reliability – a practice that however is still very limited, with many certification processes still requiring paper documents.[92] Indeed, using

analogic information collected on paper and then transferred to digital support (as is often done, for instance, on tracing for CITES[93] certificates for endangered fauna and flora) increases the risk of mistakes or tampering.

Product-backward and source-forward traceabiity

The collection of data usually takes place in two ways: in the case of product-backward traceability, the operator at the end of the supply chain collects information on the various players involved.[94] That system is however prone to mistakes and lack of transparency because of the complicated consolidation process for the information provided by operators who often gather it in very different ways. Source-forward traceability instead works in reverse, as information on the commodity is passed from the producer downward at each step, often in an organised manner that allows for the use of a single programme or a limited number of programmes across the whole supply chain.[95] This approach requires advance planning and could be significantly expensive for sectors that have not implemented any of these measures, but it has significant advantages in terms of efficiency and reliability. Indeed, in the past few years, and especially after the launch of the EUDR, many players in key sectors have started developing software and apps that support this procedure, most recently also using blockchain technology.[96] Such technologies usually cover the whole supply chain, or at least allow for farmers (and smallholders in particular) to directly insert their data into tracing systems. This is the case for instance for Farmer Connect, a platform focused on coffee,[97] which also uses blockchain technology and which was recently adopted by a variety of players, including the Dutch chain HEMA.[98] Similarly, World Wildlife Fund (WWF) and the digital agrifood service provider Agridence recently developed the app Hamurni, with the aim of including small palm oil producers more easily into product-backward traceability.[99]

2.2.3 Addressing the cost of traceability

Allocating costs of traceability

Traceability has however a cost that should not be underestimated, and that should not be borne by the smaller or weaker players in the supply chain. In the case of the EUDR and of most certification schemes (such as Fairtrade or Rainforest Alliance), it is the company that has the due diligence obligation to implement the tracing process.[100] However, especially if tracing has never been implemented for local production of the commodity, the design and implementation of the methods mentioned above could be very expensive or just too complicated for operators with limited familiarity with tracing. This scenario could discourage companies from introducing these processes, as instead they could simply start selling to buyers that have no such requirements, such as Chinese or Indian operators.[101] In other cases, various operators on the supply chain could pass through the cost of tracing (but also of assistance on implementing good agricultural practices) to farmers, by reducing the reward they should receive for the premium price consumers pay for certified or sustainable goods – this has been the case for instance with cocoa and coffee in Sulawesi in Indonesia.[102]

Solutions for cheap traceability

A solution to these issues is reducing the cost of the tracing process, as well as monitoring the equal distribution of costs along the supply chain. Technology can be of help in this, particularly concerning one of the key elements of tracing: geolocalisation. This is a key requirement for the EUDR and most certification schemes and it usually consists either of a single geolocalisation point (one latitude and one longitude) for smallholders (in the case of the EUDR, farms under 4 hectares)[103] or a polygon covering the whole plot of land, with latitude and longitude information for each corner. This is key information that has to be updated, usually annually, and that is fundamental for establishing the compliance of production: according to a Commission FAQ on the EUDR,[104] in case of the mixing of different sources, even a single untraced or illegal plot of land, in a batch of hundreds, can make the whole shipment non-compliant.

Apps and drones

Different methods are being applied to mainstream geolocalisation. For instance, in the case of coffee in Indonesia, buyers (even smaller ones) use apps such as Koltitrace created by the agri service provider Koltiva.[105] The app allows them to record the location of farmers on their profile, which is usually done once a year and while collecting coffee directly from farms.[106] Larger plantations or farms on rough or mountainous terrain are testing the use of drones to cover large areas in a very short time;[107] while agricultural drones are the best suited for this kind of mapping, they tend to be expensive and not easily accessible. However, much cheaper and easily available commercial drones are equally suited for the job: the GPS accuracy of even older models, such as the DJI Phantom 4 or Mavic 2, is far greater than most smartphones (1–3 meters accuracy, compared to 5–10),[108] and dedicated apps have been developed to allow for automatic scanning of land, such as DroneDeploy.[109] The use of this relatively cheap system does not require any special skill by the drone pilot, but only a basic understanding of the app that will automatically plan the flight and ultimately produce the polygon.

The practice of mixing traced and untraced goods is another problem affecting effective tracing. Most of the commodities analysed in this report are traded in batches and often by operators who deal at the same time with traced and untraced goods, which are sold to different buyers. The risk of mixing is high; this would make the whole batch non-compliant with certifications or with the EUDR, and is an easy and relatively wide-spread way of laundering illegal or untraced commodities. This is a rather common occurrence with timber, for instance, since legally and illegally sourced logs are often mixed by harvesting companies shortly after collection.[110] This makes it extremely complicated, if not impossible, for law enforcement agencies to indict operators for illegal logging, as proven by several examples in Latin America and in Europe (for instance regarding the HS Timber case between Romania and Austria).[111] The problem is however equally common for commodities such as palm oil, soy or coffee.

Local buyers can often use the knowledge of their producers to understand whether some among their partners have been mixing products with sources other than the one they declared. In the case of coffee producers in South Sumatra, in Indonesia, some buyers use the geospatial data they gather each year from the smallholders they receive coffee from to understand the quantity to expect.[112] Should it significantly exceed expectations, also considering variables such as the average harvest of the year, they flag the producer as a potential encroacher (since the producer could also have illegal farms in natural forests, or buy from illegal producers) and eventually exclude him from their suppliers list.[113]

2.3 STANDARDS AND CERTIFICATIONS

The certifications landscape

Due to the absence of international agreements, certifications have been for decades the only way to obtain traceable goods that, in theory, respect minimum sustainability requirements. The certifications landscape is however varied and complicated: certifications are almost entirely voluntary schemes, run by NGOs or, in a few cases, by national institutions or private companies, with little coordination among different programmes. Some sectors benefit from robust schemes (coffee), while others have limited transparency and auditing (soy, beef). The success of these arrangements is also highly dependent on the demand for certified products. It is thus significantly influenced by the visibility of the certification, by the perception of the general public and by the kind of commodity being traded. While some goods are directly sold to final consumers, who may be interested in buying sustainable products (as in the case of coffee), others are mostly sold to intermediaries who will use the commodity in their production process (as in the case of soy for pig farming), so the incentive towards more sustainable supplies is far smaller. As a consequence, the impact of certification differs depending on schemes and on commodities – while coffee certification generally has a positive impact,[114] attempts in the cattle[115] or palm oil[116] sectors have failed or produced only limited effects.

2.3.1 Heterogeneity in certification schemes

While there is a significant heterogeneity among schemes, some elements are generally shared. Certifications require participants to abide by a set of different production standards in terms of sustainable practices and traceability. Unlike the EUDR, which deals entirely with deforestation, schemes usually adopt a wider sustainability perspective – focusing on social, environmental and climate-related elements – sometimes with a stronger focus on specific issues, such as forest protection (e.g., Rainforest Alliance) or working conditions and decent income in developing countries (e.g., Fairtrade).

While some schemes only deal with farmers, others also involve different operators in the supply chain; this is the case for Fairtrade, for instance, which has

producers networks, and deals with exporters, importers and regional markets, but also national organisations, while at the same time monitoring the manufacturing side as well.[117] This is usually a central part of the success of the certification, because it grants certified products a special access to the market, and it offers a minimum premium price for the producers joining the schemes – in the case of Fairtrade, buyers must pay the established minimum price for the commodity (or, if this does not exist, 15 per cent extra on market price)[118] to be included in the scheme. The economic reward is the key driver for producers to join certifications, so it is vital for their success to distribute the reward evenly (which, as already mentioned, is not always the case)[119] and to reach enough consumers to gain adequate resources. In this sense, certifications usually face the difficult task of bridging between local producers, often smallholders, and international consumers.

Giving preferential access to the market

2.3.2 Private certification schemes and standards

Pros and cons of private sponsored schemes

While certifications are mostly run by civil society, there is a growing tendency of company-led standards, likely pushed by the greater visibility of environmental issues in the past decade and by the greater environmental awareness of consumers – which, in turn, could guarantee companies a preference or a price premium from final buyers if they go sustainable. The process is similar to other certifications: enterprises set up sustainability standards for the producers they buy from, that can be more or less strict – in the case of the South African vegetables and flowers company Woolworths this consists of a score card, the only requirement for farmers being the annual improvement of their evaluation.[120] The definition of these standards and their actual implementation is then audited by third parties. In other cases, it is a group of producers or sector associations, instead of individual companies, that propose the standards. The effectiveness of these company-led schemes is still unclear, also due to a lack of research on the topic[121]; on the one hand, companies could have a much greater chance at succeeding in the implementation of standards, since they usually have a better understanding of their supply chain and also hold significant power over their producers, at least in the case of major international businesses such as Unilever (which committed in 2010 to 100 per cent sustainable supply for its products).[122] On the other hand, since companies are largely profit-led and focused on shareholder interest, they could lack an effective driver to translate these commitments into actual change.[123] Companies could also maximise the visibility of their efforts, while having low incentives to show failures and criticalities in the implementation of these standards. In most cases, company-led schemes ultimately face the same challenges as other certifications: in 2020 Unilever reached only 62 per cent of its 100 per cent target (although with a remarkable increase from the 14 per cent of a decade before),[124] lamenting issues in tracing and fully implementing standards along convoluted and often not transparent international supply chains.

National and international standards also play a role, particularly FAO's Good Agricultural Practices (GAP),[125] which many countries (especially developing and low-middle-income ones) and some certification schemes use as a basis for their own standards. While promoting a sustainable approach to agriculture, they however often miss a focus on tracing (as in the case of GAP) and thus have a limited impact on trade.

2.3.3 Certifications among different commodities

Cocoa and coffee

Different commodities have had different success in relation to certification schemes. Among internationally traded commodities, coffee and cocoa are the two that to some extent have had the most success in implementing effective certifications. The two benefit from some of the most well-known certifications, such as Rainforest Alliance, Fairtrade, Organic and 4c. In 2022, certified coffee amounted to some 30 per cent of global purchases[126] – a limited quantity, but still significantly larger than any of the other commodities considered in this report. The effectiveness of certifications is debated: from an environmental perspective, coffee schemes are generally considered effective in improving ecosystem services, in reducing deforestation and in significantly mitigating the impact of cultivation on habitats – this is the case for instance in Vietnam,[127] the second global producer of coffee, but also for the smaller production of Uganda.[128] Evidence on cocoa is by contrast much less straightforward,[129] and certifications for both commodities have proved to have alternating success regarding empowerment and increased income for farmers.[130]

Palm oil

The situation regarding other commodities is bleaker. There have been several attempts to produce certified palm oil in many Southeast Asian countries, particularly after the huge impact on forests of its production since the 1990s has become manifest to the global audience, yet without significant results. This is for instance the case for the Malaysian Sustainable Palm Oil (MSPO)[131] and the Indonesia Sustainable Palm Oil (ISPO) certification,[132] both run by national governments and started respectively in 2015 and 2011. Tree-cover loss data show that between 2001 and 2016 40 per cent of palm-oil-related deforestation in Malaysia, Indonesia and Papua New Guinea took place in certified concessions, and that this trend is continuing.[133] Even non-governmental certifications, such as the Roundtable of Sustainable Palm Oil (RSPO) have led to very limited results.[134] Corruption, strong power of major palm oil companies and very limited interest and capability of smallholders to implement the certification standards have been among the main issues undermining their success.

Soy

The soy sector has witnessed similar attempts, with limited results. The most relevant outcomes were achieved by the 2006 Amazon Soy Moratorium,[135] which is however more of a sectoral agreement than a proper certification. Schemes run in areas such as Southern Brazil[136] have had a limited impact in terms of en-

vironmental improvements and farmers' income, with insufficient auditing and transparency. Associations such as the Round Table on Responsible Soy offer international certification, but their impact has not been fully estimated yet.

Rubber

Rubber has only a few certifications available, particularly those proposed by the Forest Stewardship Council (FSC)[137] and of the Programme for the Endorsement of Forest Certification (PFSC),[138] but their impact has been limited and their results mixed. They also still heavily rely for their implementation on the support of national institutions[139] (as in the case, for instance, of FSC certifications in southern Thailand),[140] which in turn limits their independence and makes them sensitive to political changes. The heavy market fluctuations for the rubber sector have likely been another major hindrance to the adoption of certifications, which require at least a medium-term perspective for effective implementation.[141]

Beef

Cattle has been so far one of the least successful sectors when it comes to the effectiveness of certification. After ten years of attempts to make its beef certification work, the Rainforest Alliance decided to drop its scheme in 2020,[142] and other initiatives similarly failed because of the very small and very niche demand for certified beef[143] – also due to the structure of the market and the limited visibility given to beef traceability.[144]

Despite all the interference and the limited results achieved by certification schemes, they have played a key role not only as the main and for some time the only way to implement sustainable production for major agricultural commodities, but also in paving the way for ambitious policies – the EUDR in particular – as discussed in section 3.4 of this report.

2.4 ENFORCEMENT

Another key element in promoting sustainable agricultural production is adequate enforcement of regulations – and, also, one that has been notoriously missing on the national and international level in the past decades.

Enforcement concerns the monitoring of compliance with national and international laws and the issuing of fines or of criminal punishments – depending on the offense and on the legislative framework, both can be applied. In this sense, enforcement regards a confined range of activities – i.e., all those that explicitly go against national or international legislation.

Enforcement is however a much more powerful tool than any voluntary scheme and, if effective, can become a game-changer in tackling the problem. Investiga-

tions of forest fires caused by palm oil companies in Indonesia proved complicated in the early 2000s, since they were widely obstructed by companies and politicians alike but, after efforts to boost enforcement, they have proved effective in recent years in limiting the phenomenon and compensating for the damage caused to ecosystems and communities (see the case study in section 2.6).[145]

Institutions involved in enforcement

Enforcement is the responsibility of several different authorities, almost entirely on the national and local level: police forces, environmental and other dedicated agencies, ministries and, in relation to international trade, also customs. International organisations, such as Interpol, Europol or the United Nations Office on Drugs and Crime (UNODC), sometimes support these investigations but cannot start or lead such operations, their function being mostly limited to capacity training and improving information exchange. Civil society often plays a significant role; in the case of Indonesian forest fires or of illegal palm oil trade, local NGOs often investigate the events and provide national authorities with a set of proofs, such as satellite images, drone photos and other evidence gathered by, for instance, following the trucks of illegal producers.[146] They are however obliged to rely on national authorities, who ultimately are the ones to lead the investigation. Cooperation between enforcement agencies and civil society has however often proved challenging in most countries.

2.4.1 State of enforcement

The momentum of enforcement

Despite the many challenges, this is a particularly good time to focus on enforcement in both producing and receiving countries. On the international level, there is a growing attention to environmental crimes and to the work done by enforcement agencies to counteract them[147] – and some of the most relevant offenses directly contribute to increasing the impact of agriculture on global forests. Illegal logging and forest degradation are indeed getting more and more attention on the global stage, as well as the grabbing of public and community lands, forest fires and the use of illegal pesticides. However, also financial and tax crimes can have a direct impact on the relation between agriculture and forests (particularly in the case of Brazil).[148]

UN and the EU

On the global stage, UNODC has been giving greater attention to environmental crimes in recent years, as for instance already highlighted on a number of occasions by UNODC's director, particularly during the climate COPs.[149] In 2022 the European Council for the second time confirmed environmental crimes as a top priority in the EU policy cycle to tackle organised and serious international crime.[150] The EUDR itself is promoting a strong synergy with another piece of EU legislation, the Environmental Crime Directive, which has been recently updated.[151] In later phases of its implementation, the EUDR itself is expected to adopt criminal penalties to address breaches,[152] but even now it includes a detailed list of penalties, such as a fine of "at least 4 % of the operator's or trader's

total annual Union-wide turnover in the financial year preceding the fining decision", confiscation of products and revenues, exclusion from public procurement processes and from public funding, as well as temporary exclusion from the EU market. Effective enforcement will be key to turn all of this into action.

Organised crime

The link between illegal deforestation for agriculture and violent and organised crime is also strong and, in some regions, growing stronger, due to the increasing revenues in sectors such as the illegal trafficking of timber[153] and of illegal agricultural products, such as palm oil.[154] This is an indirect consequence of the mismatch between regulations, which have grown stronger on the national and international level in almost all sectors, and enforcement, often still barely different from one or two decades ago.

2.4.2 Obstacles to enforcement

Insufficient legislation

Obstacles to proper enforcement are numerous and belong to both the legislative and operative sides. In some cases national legislation is simply not strong enough to act as a deterrent for offenders – as in the case of deforestation in Malaysia, which relied on outdated and inadequate 1984 legislation that was only effectively changed in 2021.[155] Even when legislation is strong, it may not be detailed enough, leaving ample margins for interpretation by judges and prosecutors, who may lack the knowledge to fully understand environmental offenses and may then stop or limit investigations. While this is usually not the case in countries which have dealt with deforestation for decades (such as Brazil or Malaysia), judges and prosecutors in EU member states often have limited knowledge on environmental matters and on illegal trade.[156]

Lack of specialisation

Lack of specialisation is indeed the main obstacle to enforcing environmental regulations. It is an issue that affects all levels of enforcement, from police forces to administrative authorities, the judiciary and prosecutors. While growing regulations on the national and international level require increasing specialisation on environmental matters at all levels – even for officers working on the ground – training and capacity building are expensive activities often disregarded by many authorities. As already recalled, there is a significant mismatch between an increasingly specialised legislative framework and an enforcement structure which has not particularly changed over the years in many countries, on both the international level and even within the EU.[157] This adds a level of complexity to enforcing many regulations, particularly the EUDR; the regulation indeed relies on competent authorities in EU member states to perform checks on producers and traders, but their level of specialisation is quite varied – while countries such as Spain or Italy have environmental officers numbering in the thousands, Bulgaria has less then ten, for instance.[158] This is equally valid for authorities in extra-EU trading partners, on whom EU member states' competent authorities must rely to perform checks on the ground: the level of specialisation, resources and re-

liability among agencies in countries such as Indonesia, Vietnam and Brazil varies considerably, as it does their ability to adapt to new legislation.

Lack of cooperation

Due to the transnational nature of these offenses, exchange of information between national authorities is key for enforcement. However, cooperation is still very weak; platforms for information sharing such as those offered by Interpol and Europol have so far had limited access and have almost never been applied to agriculture-related deforestation.[159] While the EUDR promotes "adequate exchange of information, coordination and cooperation",[160] the EU has not proposed any dedicated tool to achieve this (at least for the time being).

Corruption

Corruption is another key element in preventing effective enforcement, and perhaps the most well known and debated. The link between corruption and deforestation is clear and has been proven across different countries and periods.[161] Not by chance, the EU's flagship initiative on illegal logging, the FLEGT, largely focused on the issue from its inception. Many efforts made by countries affected by deforestation have also concerned addressing corruption at all levels – as in the case of Indonesia's Corruption Eradication Commission.[162] Corruption affects deforestation at all levels, from ministries to low-level forestry or customs officers, but efforts to fight it have usually not been particularly effective, especially regarding representatives at the top of the hierarchy. While it is very complicated to fight corruption, and almost impossible for international players to address an issue which is largely domestic, it is key to understand that providing an unsuitable environment for corruption should be central to any kind of regulation – an issue which is not addressed in the EUDR and could thus represent a major flaw.

The interference of national interests

Another element preventing effective enforcement is national and political interests. Bolsonaro's Brazil not only witnessed a spike in deforestation rates, but also a significant decrease in environmental fines[163]; this was a clear sign that the mix of reduced available resources and the installation of new managers in Ibama, the country's main environmental agency, had a direct effect on enforcement of the strong Brazilian environmental regulations. Vested regional political interests in Indonesia still influence the enforcement of environmental regulations, as often local politicians have been colluding with palm oil companies following patterns dating back to the Suharto dictatorship.[164]

2.4.3 Tools for enforcement

All these issues are not without solution, and empowering enforcement agencies will be key – particularly by providing them resources that match the level of ambition of regulations such as the EUDR. Capacity building and joint investigations have proved effective in some sectors, such as waste trafficking,[165] but they are truly successful when they are not entirely trusted just to member states' auth-

orities, but coordinated at the EU level – indeed, EU-wide regulatory perspective of items such as the EUDR should be matched by a EU-wide vision on enforcement, not by a national one.

Technology for enforcement

Finally, technology can again be of help, just as for certification. Satellite imagery analysis already plays a key role in detecting deforestation, as well as forest degradation; in particular, the use of multispectral images allows us to understand whether natural forests are being gradually replaced by fruit trees, or if roads are being opened under the canopy – this can also be used as a tool to prevent deforestation, by spotting areas where changes are occurring before they are logged.[166] The monitoring of very large or inaccessible areas is becoming easier and quicker through the use of drones, since commercial and relatively cheap versions such as the DJI Mavic series now have the reliability and autonomy needed for this kind of operations. As is true for certification processes, apps can also play a role in enforcement, by reducing the need for specialisation by ground officers; in the case of software such as the Sumal 2.0 currently being adopted by the Romanian police for timber trade, checks can be performed directly by specialised central units that are connected through the app.[167]

2.5 SMALLHOLDERS, COMMUNITIES AND INDIGENOUS PEOPLE

The social component is one of the central elements to address to reduce the impact of agriculture on global forests, but it is also one of the most complicated and multi-faceted. In many countries and in many sectors smallholders and community farming play a key role in the agricultural production that will be shipped to Europe: this is the case for coffee in Indonesia, which is dominated by smallholders, but also to some extent palm oil in the country, or rubber in several South-East Asia countries, and even cattle and soy in some parts of Latin America. In 2018, 55 per cent of the world's food was produced in farms below 10 hectares and around 80 per cent is likely from family farms (i.e., farms operated mostly by family members).[168]

2.5.1 Benefits of supporting communities

Communities for monitoring and enforcement

Addressing the social component of agriculture is key for several reasons. If adequately trained and supported, communities are the first line of protection for forests, whether they own the farms or not. No external enforcement can match the constant monitoring that the people living nearby or even in the forest can enact against forest disturbance, and strong communities are also an antidote to the illegal grabbing of public land that is directly associated to agriculture-related deforestation.[169] The contribution of indigenous people is particularly rel-

evant; 36 per cent of the remaining world's pristine forests are on indigenous land, which also holds some 80 per cent of global biodiversity.[170] This is also because indigenous communities adopt forest stewardship and land management techniques that in most cases are beneficial to the forests' health, and because they are also directly involved in their protection against high-impact projects (agricultural, but also those belonging to mining and the oil and gas sector). This is true not just for indigenous communities, but also more generally for "forest communities": the more intertwined is the life of a community with the forest, the more the former will protect the latter.[171]

Positive social spillovers

Counting on communities has also a series of positive spillover effects. People who depend the most on forest income usually belong to the most fragile strata of the population; healthy forests help reduce poverty, diminish social conflict and increase local political stability.[172] The involvement of local communities in forest and land governance increases its transparency and accountability and reduces corruption, as well as the cost of enforcement and the need for it. It also alleviates the well-documented "parks vs. people" conflict, i.e., the hostility of local communities against conservation initiatives (such as the establishment of parks) that could limit their access to land.[173] Clashes between stricter visions on conservation, in many cases promoted by people or organisations external to local communities, and the traditional use of lands have in many cases led to ineffective protection of the forests and to the exacerbation of social conflicts. The case of the Mau forest in Kenya is particularly illustrative, since conservation efforts quickly triggered conflict, which led to police abuses, violent evictions and even suicides over many years, but failed to produce significant results in terms of forest protection.[174]

Issues in dealing with communities

While working with local communities is fundamental, it could also be particularly complicated. Production from smallholders is much more complicated to trace: there are more intermediate steps in the supply chain and more producers to monitor, who are also more spread out, often distributed in remote locations, and have significantly less means for tracing. Small-scale agriculture is often more expensive and offers lower returns than larger plantations, especially considering that smallholders are less prone to using fertilisers or more advanced agronomic techniques, and thus in some cases have a smaller yield per hectare. Smallholders and communities also face greater operational costs they often incur because of more complicated access to capital and to infrastructures compared to larger plantations. This dynamic sometimes pushes farmers to further encroach on the forest to increase their production and thus their income. Indeed, while larger plantations are responsible for most of the deforestation, it is also true that the impact of smallholders is not negligible (roughly around 10–12 per cent of total deforestation in the 2010s in Brazil[175] and Indonesia[176]) and that their role is central for commodities such as cocoa and coffee.

2.5.2 Towards effective decentralised forest management: Tenure, training, and operational costs

Refocusing forestry and land management towards communities (sometimes called decentralised forest management)[177] could be a disparate process across different countries, but a few shared elements should be considered for it to be fully successful.

True land ownership for communities

First, this is usually more effective when communities are given control over the management of forests: in some cases, the shift of power is only apparent.[178] Tenure and land ownership has also been an obstacle in many cases, particularly concerning indigenous territories: lack of protection of indigenous land or unclear ownership of land often associates with more forest degradation and deforestation.[179] Ownership is indeed key: communities have a greater tendency to protect forests that they know they own – and will keep owning – than forest land controlled by the state.[180] This is even more true when the role of forest income and of services provided by forests are greater and communities are more aware of the benefits they are receiving from these ecosystems[181] – a fact which also correlates with the community level of education on agronomic and ecological matters.

Raising awareness

Indeed, supporting communities in understanding and reducing their impact on forests is a central element of this process. Large shares of the population in rural areas lack the education and environmental awareness to shift towards sustainable, forest-positive methods or are too much exposed to price fluctuations or risk falling below the poverty line. This is the case for poorer, isolated smallholders, such as rubber or coffee producers in Indonesia, but also for wealthier small-scale farmers, such as cattle ranchers in the Parà state of Brazil.[182] It is thus impossible to expect community farming to always be naturally sustainable, or to expect that a change in that direction will happen spontaneously. Support should come in different forms and could come from different players – much is currently done by associations and NGOs, such as Imaflora or NWF in Brazil, but also by national international institutions and private companies.

Traning and capacity building

Support is often provided through training and capacity building on best agricultural practices, which are however most effective if adapted to the geographical and societal landscape of the community – a recurring mistake in the past, especially by international organisations, has been to focus too much on one-size-fits-all solutions, easier to disseminate but significantly less effective than tailored measures. However, this is a support that often extends to accessing and understanding the laws and documentation regulating the community's ownership of forests and of the land, in order to improve their involvement in forest governance but also to avoid land grabbing.[183] Direct economic support to communities is fundamental to promote a shift to sustainable farming and

compliance with national and international regulations; this sometimes take the shape of the premium price paid for certified products, but also as a compensation for the ecosystem services provided by their positive management of the forest.[184]

2.5.3 Towards effective decentralised forest management: Policies

Supporting communities in understanding regulations

Complying with standards for certification and with international regulations has been an issue for smallholders and, to some extent, this has changed little in recent times. Some certification schemes have had very little success with smallholders because of high costs (real or perceived), as in the case of palm oil.[185] Some policies have also had the negative and unplanned effect of restricting access to the international market because of requirements that were too expensive for smallholders to comply with; the most notable case is the EUTR, which penalised small timber producers and favoured larger ones which had better resources to comply with the Regulation,[186] without however achieving notable results in reducing illegal logging for both kinds of producers.[187] The EUDR largely adopts the same approach as the EUTR and the risk of replicating the same mistake, to the detriment of communities and smallholders, is indeed real (see section 3.4).

2.6 CASE STUDY

INDONESIA, MONITORING FOREST FIRES IN PALM OIL PLANTATIONS IN RIAU AND EAST KALIMANTAN

OVERVIEW

Forest fires have been one of the main causes behind deforestation and forest degradation in Indonesia in the past two decades and, after a few years during which they significantly declined, the number has increased again following the end of the pandemic.[188]

Forest fires are usually started by major palm oil producers and, in only a few cases, by the producers of other commodities and by smallholders (although fires started by the latter are rarely as devastating as those caused by big companies). They are used to clear the land of natural forest, secondary forest, vegetation or of plantations that are not productive anymore, to start new plantations (in most cases for palm oil). The use of fire has the advantage of being a cheap way to clear the land (especially considering oil palms, which are relatively expensive to get rid of). It also usually changes the pH of the soil to make it fitter for the cultivation of palm oil, since peat, the soil on which the most important Indonesian forests grow, is often too acidic.

« Circa 300-400 hectares of forest burned in East Kalimantan, Indonesia

The impact of these fires is devastating and goes beyond the sole destruction of forests. Peatlands store huge quantity of carbon – 57 Gt in Indonesia alone – that are released during the burning. The smoke is intense and blankets entire provinces of the country, sometimes spilling over to nearby Malaysia.[189] This in turn causes hundreds of thousands of respiratory illnesses, with an estimate 36,000 people dying in Sumatra and Kalimantan every year because of smoke from peatland fires.[190]

Stopping these fires has been historically complicated ever since they started, between the late 90s and the early 2000s. They usually happen in remote areas whose access is controlled by the plantation owners, in some cases with paramilitary soldiers guarding the area. Corruption and lack of resources for local authorities hamper effective enforcement. Tracing is scarce and mixing between legal and illegal palm oil happens frequently[191]; considering that Indonesian palm oil represents a solid 47 per cent of EU imports,[192] it is very likely that a significant share of it is actually illegal and that tracing this using EUDR measures will be complicated. Convicting companies has also been a difficult task; in the early 2000s the burden of proof requested by courts was very high, since in most cases they would require a direct proof of company representatives actually starting the fire (which, in most cases, would have not happened).[193]

SOLUTION

The situation has improved in recent years, also thanks to the work of NGOs and academics who raised awareness on the issue and developed legislative proposals and techniques that made investigations easier and fines stronger. Among these, Professor Bambang Saharjo from Bogor Agricultural University has been one of the most outstanding figures; he has been an expert witness in these cases since the early attempts to bring palm oil companies to court, participating in more than five hundred cases. He earned the 2019 John Maddox Prize following death threats and intimidation for his work, including a multi-billion lawsuit that was ultimately retracted.[194]

Dr. Saharjo applied a vast series of forensic techniques to prove the guilt of companies. In several cases he has used satellite images to prove that the burned area was exactly within the borders of the company's concession, and that fire had been contained inside it through the opening of water channels along these boundaries, thus showing the wilful intent of the action.[194] In a 2021 case, he used satellite imagery tracing backwards to 2004, along the various steps that ultimately led natural forest to be replaced by plantations: clearing, opening of roads and degradation of the forest and, ultimately, a forest fire.[196]

A network of local NGOs also collaborates with academics such as Bambang Saharjo. This is the case for instance with Jikahalari, based in the Riau province of Sumatra, and with Titian, in East Kalimantan. Both organisations have GIS analysts who use data from the NASA platform FIRMS[197] and the ESA EFFIS[198] that will show in almost real time the location of active fires globally. Since these data do not show the true extent of fires, the most interesting areas (e.g., where there is a cluster of active fires) will be checked by NGO staff on the ground. Commercial drones such as the DJI Phantom 4 or Mavic 1 are usually employed to gather evidence from a distance, for safety and accessibility reasons. Such images and videos are then sent to local or national authorities as evidence.[199] On several occasions Dr. Saharjo and these NGOs have cooperated on such cases; while civil society provides solid proof from the ground, expert witnesses have access to information such as concession maps that are not usually available to the public. Indeed, one of the main issues is the absence of this kind of data: there is no digitalised version of the maps of land ownership and concessions in the country, and sometimes even authorities do not have recent or reliable charts for some areas.[200] While this is being addressed by the One Map Initiative at the moment,[201] this situation has also generated unclear land tenure in many cases and has been exploited by palm oil companies for decades, to the detriment of forests and local communities.

A channel dug to avoid fires spreading to cultivated land in East Kalimantan, Indonesia »

2.7 CASE STUDY BRAZIL, EUDR AND COFFEE PRODUCTION IN SOUTHERN MINAS GERAIS

OVERVIEW

Minas Gerais is the heart of coffee production in Brazil. In 2022 it has produced an estimate of 29 million bags (each equivalent to 60 kilos),[202] much more than the second largest producing region (Espírito Santo, 13 million bags) and the third (São Paulo, 5 million). As Brazil is the largest exporter of coffee worldwide, in a sense Minas Gerais is the heart of global coffee production, a position it also held historically. Indeed, Minas Gerais was one of the centres of the coffee boom between the 1870s and the 1920s, when Brazil was almost a monopolist of international coffee trade and exports came largely from the state.

This has created some of the best conditions for the mass production of coffee with a smaller impact on forests than other Brazilian states or countries, and this is valid especially for the South of Minas Gerais; production there is much more consolidated, on plots that have a long history of agriculture and of international trade of commodities, and in areas where forest has already been cut or degraded decades ago, with consequently a smaller risk of new deforestation.

Work on sustainability is extensive in Southern Minas Gerais. Buyers such as Exportadora de Café Guaxupé have been providing capacity building to producers for 12 years now,[203] in order to open up the market for certified coffee to smaller and major producers. There are several larger producers (600–700 hectares) that are autonomously investing in additional forest protection, training and even wildlife protection (as in the case of those participating in the ASAS project);[204] smaller ones (circa 30–70 hectares) tend instead to be less aware of sustainable practices and have over the years been strongly supported by buyers. Other producers are also involved in a number of reforestation activities, such as SOS Mata Atlantica, on the restoration of the Atlantic Forest (which also extends to other states, such as São Paulo).[205]

This does not mean that production is completely risk free: Minas Gerais has forest cover over 32 per cent of its land,[206] comprising a substantial amount of the remaining Atlantic Forest, which is one of the most critically endangered biomes in Brazil. Deforestation still happens, but the forest loss rate is very low thanks to reforestation activities and significant protection.

« A medium-sized coffee producer in Minas Gerais, Brazil

SOLUTION

The Southern part of Minas Gerais could represent an interesting challenge for implementation of the EUDR. On the one hand, according to current EUDR rules, whatever risk level will be applied to Brazil will be the same for coffee in Minas Gerais and for other states and other commodities. However, the state has a significantly smaller risk of deforestation than, for instance, coffee produced in Bahia or soy in Amazonas. National competent authorities could decide to focus their checks on shipments from other areas they perceive as risker, but the evaluation will be individual and not coordinated on the EU level. If authorities are not particularly knowledgeable about coffee production, they could risk losing time and budget checks that are ultimately not needed.

The EUDR is also already having an impact on producers. Some actually approve of the Regulation, either because they believe it will not be a big issue as they are already certified,[207] or because they just believe it is a good measure to protect the environment.[208]

Nevertheless, the overall perception is still not positive; some complain about the level of uncertainty that still surrounds the Regulation and have declared that they are not taking some land management decision (such as clearing a patch of land where some forest has regrown) because of this lack of clarity.[209] In some cases, they perceive as unfair the fact that they will receive the same risk evaluation as other states or regions that are very different.[210] Confusion over the aim of the Regulation is also very common, with almost all producers believing it will affect also the pesticide or fertiliser they will be compelled to use.[211] The buyer also admitted that they have not shared the cut-off date of the EUDR, otherwise it could scare producers away from the EU and the certified market.[212]

Southern Minas Gerais will be a valid testing ground for the EUDR; it will be key to understand the role of certifications for the Regulation (covering some 30 per cent of the whole production in the area),[213] while trying to understand ways to distinguish between areas and commodities with a higher level of risk even within the same country. Being likely the key producing region for coffee in the world, it will also be fundamental to achieve an effective implementation to avoid a negative impact on the EU agrifood industry.

The protected forest in a coffee farm, localised on a spring and along a river in Minas Gerais, Brazil »

3. POLICY AND FINANCIAL SOLUTIONS

A poor policy landscape on the global level

Policies are key instruments to produce an international trade environment that can support forest-positive agricultural products. The EU has been at the forefront of this process for at least two decades, but it has historically faced troubles in implementing effective measures for a number of reasons: first and foremost, because of complex supply chains that lack the transparency and the methodologies to both implement sustainable agriculture approaches and trace and monitor the trade of the related products. A limited response from consumers, the lack of effective international measures and platforms, as well as the limited interest from trading partners and from other large buyers, such as China and the US, have all also limited the effectiveness of EU action.

The change

As the EU has now launched its most ambitious piece of legislation in this sense, the EUDR, the global situation has to some extent changed. Global environmental awareness has significantly increased, particularly after the 2015 Paris Agreement, and the private sector has started playing a significant role in the ecological transition. However, the agricultural sector has undergone less progress compared to others – above all the energy one – and the EUDR still remains a rather isolated attempt at the global level. Supply chains are also almost as intricate as they were in the early 2000s.

A complex financial background

At the same time, regulations and policy instruments are only effective when the financial system, both public and private, is able to mobilise the necessary funds to keep them operational. Expansion of the reach of financial mechanisms is essential to allow producers and buyers to overcome credit constraints and to face up-front costs preventing them from adopting sustainability practices, especially for the first time. Furthermore, tailored investments along the agricultural supply chains may change the incentives that local producers face.

This chapter will thus analyse a variety of policies and financial tools promoting forest-positive agriculture, highlighting the successful and the ineffective elements of frameworks enacted by the EU, the UN, the US and other players.

3.1 INTERNATIONAL ATTENTION AND CHALLENGES TO IMPLEMENTING SOLUTIONS

International attention to agriculture-driven deforestation is growing, as shown by the promises made at the 2022 COP15 to the Convention on Biological Diversity,[214] which has established long-term targets for 2030.[215] The main objective of these targets is to maintain and enhance the integrity of all ecosystems, particularly those that host large shares of global biodiversity such as primary forests.[216] At COP26 the Glasgow Leaders' Declaration on Forests and Land Use was adopted with the primary objective of halting and reversing forest loss and land

« The port of Santos, Sao Paulo state, Brazil

COPs and raising awareness on agriculture and deforestation

degradation by the year 2030.[217] At COP27, building on the Glasgow Declaration, the Forest and Climate Leaders' Partnership (FCLP) was launched, aiming to unify efforts of governments, businesses and community leaders in sustainable forest management and conservation; the FCLP focuses on mobilising finance, supporting indigenous and local community initiatives and conserving high-integrity forests.[218] During COP28, the European Commission along with Germany, the Netherlands and France, unveiled the Team Europe Initiative on Deforestation-Free Value Chains. This initiative is designed to support partner countries in their shift towards sustainable, lawful and deforestation-free agricultural supply chains. A key feature of the initiative is the Sustainable Agriculture for Forest Ecosystems (SAFE) project. The SAFE project focuses on enhancing accountability, transparency and traceability of the origins of agricultural commodities, underpinning the broader goals of the initiative.[219]

Missing targets

However, achieving forest preservation goals is proving challenging. The previous target set with the New York Declaration on Forests in 2014 aimed to cut deforestation in half by 2020 and halt it entirely by 2030. The 2020 target was not met and the international community is not on track to reach the 2030 goal either.[220] Furthermore, there is no consensus on how to tackle the problem. There is no universally accepted method to differentiate between forested and non-forested areas, to make a clear distinction between deforestation and forest degradation and to effectively verify the size of illegal deforestation. Consequently, diverse policymaking and research frameworks adopt various criteria for their solutions and scope, hindering clear communication and cooperation on the topic.

3.2 UN

The work of UN agencies and the CBD

The UN and its agencies are significantly involved in the shift towards forest-positive agriculture, but results have been limited in past decades. Most of the work of the FAO, UNEP, UNDP and other institutions focuses on gathering data, on training and capacity building and on the promotion of good agricultural practices, with specific attention to approaches such as sustainable forest management and climate- smart agriculture. Not by chance the FAO also produces one of the most relevant reports on the health of global forests.[221] However, there are no compulsory schemes or treaties that have been signed on agriculture, and even those that at least partially touch upon the sector have done very little to change or regulate international trade. The Paris Agreement on climate change does not mention agriculture in its original text and it was not until COP23 that the topic was addressed, although very generally.[222] The discussion during the following COPs rarely touched upon the topic; the results of COP28 are relevant, but they have yet to translate into effective instruments. The Kunming-Montreal Global Biodiversity Framework, the recent agreement on biodiversity signed in 2022

under the umbrella of the Convention of Biological Diversity (CBD), dedicates a target to sustainable agriculture (Target 10),[223] but this is equally general and hasn't translated yet into anything practical

3.2.1 REDD+

Overview of REDD+

The only working programme run by the UN on agriculture is the REDD+, which stands for Reducing Emissions from Deforestation and forest degradation in Developing countries (the + was added after the COP19 negotiations in Warsaw that expanded the project).[224] REDD+ is a voluntary framework which the UNFCCC has run for more than 15 years (if we consider also the original REDD) and which aims at compensating developing countries for their efforts in reducing deforestation and the greenhouse gases resulting from that. The programme provides developing countries which prove to have implemented activities or policies that reduce deforestation, with funds compensating them for their work. It is the first serious attempt to reduce the impact of deforestation and forest degradation on climate change and, indirectly, of agricultural activities on global forests (by far largest cause of LULUCF[225] emissions). It has managed to deliver a relatively substantial amount of money (some 1 billion dollars in total),[226] thus constituting one of the first attempts towards climate finance.

A very limited impact on deforestation

Nevertheless, the impact of REDD+ has so far been very limited. Most studies reveal that its role in reducing emissions or improving community participation in forest management has been relatively small, and that when it was most effective this was due to external factors (improvement of land tenure, involvement of national programmes and authorities in the area).[227] Reasons behind this limited success are many. Being a voluntary scheme, REDD+ managed to move a fairly small amount of resources, compared to the enormous need required to shift the agriculture and forestry sectors towards sustainability. REDD+ also largely focuses on communities, although it is well known that the problem of agriculture-driven deforestation mostly lies with large plantations.[228] This is likely because REDD+ is more of an "aid" measure and thus tries to channel its funding towards making sure that the protection of forests does not come at the harm of the communities living on them. However, most national plans and projects to implement REDD+ also endorse the rather common narrative that identifies communities as the first driver for deforestation through unsustainable practices.[229] While this reasoning has been widely disavowed, it is still evident in many REDD+ sponsored projects and likely contributed to its small achievements. The involvement of the private sector has also been very limited, although attempts to attract the participation and investments of companies have been going on since the early 2010s. The limited scope and structure of REDD+ has probably been one of the major disincentives for the private sector to join the initiative, as well as the inability to fully integrate REDD+ within other emission trading systems (most notably the EU ETS, the most developed so far on the global level).

Even payments have been disputed in several cases. One of the most well known concerned the 103.8 million dollars delivered to Indonesia in 2020 for avoiding 20.3 million tons of carbon dioxide equivalent (CO_2e) through preventing deforestation.[230] Several scientists, spokespeople from environmental organisations, and even from the Green Climate Fund (GCF) board, the institution delivering the REDD+ money, criticised the estimation saying it went well above its actual impact on deforestation, and that it had very limited effects on communities and indigenous people as well.

What future for REDD+?

REDD+ could further evolve after the next climate negotiations and especially following the discussion over the Global Stocktake revision that took place at COP28. While it will remain a useful tool to provide guidance for sustainable forestry and farming practices, it is not clear how its impact on global agriculture could finally become relevant; among the several pending issues, other climate finance tools are now being developed, as in the case of the Green Climate Fund[231] or the Global Environment Fund,[232] and they could subtract resources from the scheme. REDD+ also remains a climate-focused aid tool that only indirectly deals with farming and forest health; the need is instead for a global-wide regulation framework for agricultural trade that, at least considering UN platforms, is still missing.

3.3 US, CHINA AND OTHER COUNTRIES

3.3.1 US

The FOREST Act

Outside the EU, the US has been the only major international player that has so far produced a piece of legislation that can match the EUDR: the Fostering Overseas Rule of Law and Environmentally Sound Trade (FOREST) Act,[233] proposed by two House representatives and a senator from the Democratic party in 2021. The proposal is very similar to the EUDR, and in this sense it shares its strengths and weaknesses. The FOREST Act indeed introduces a ban on the import of six commodities causing deforestation – the same six as the EUDR's, but with the notable exclusion of coffee. The guarantee that commodities have caused no deforestation is a responsibility of the importer, which should exercise "reasonable care" – the equivalent of the EUTR's and EUDR's "due diligence". If approved, the Act would likewise define a series of countries that are considered at "high risk" of illegal deforestation, providing an action plan for each of them that will translate into specific requirements for importers. The bill also expects USAID and US State Departments to use the funds gathered through penalties to channel financial support and other kinds of assistance to these countries.

The language of the bill is slightly different than that of EU legislation, with a stronger focus on enforcement and on fighting organised crime groups and corruption, building on the distinct US approach on fighting illegal logging (which is

much more focused on enforcement, unlike the EU's attention to prevention). The most notable difference is however in the constant of use of the expression "illegal deforestation" throughout the document; unlike the EUDR, which covers both legal and illegal deforestation, the US approach seems to maintain the same tight focus on legality that was behind the EUTR – and which to some extent has proved one of the main limitations to its effectiveness. The bill has also not been discussed since 2021 and, considering the complicated geopolitical situation and the convoluted domestic situation in the US before the 2024 elections, it is not particularly likely that it will be debated any time soon.

3.3.2 China and other players

The revision of the Forest Law

China, the other major player behind global deforestation, has yet to even propose any kind of legislation on regulating deforestation and agriculture from an international trade perspective. The country has however made some progress in recent times; in 2019 it revised its Forest Law, introducing a ban on illegal timber (on importing, but also transporting, processing and exporting) and has started demanding importers' data records for raw materials.[234] This is rather similar to the approach taken by the EUTR and by the Lacey Act in the US, and could thus become a starting point for further work on commodities causing deforestation. In April 2023, China has also launched a joint strategy with Brazil to control deforestation, focusing on the trade of illegal products.[235] The joint statement, although ambitious, fails to name agriculture and has solely a climate focus.[236] Considering the impact of the growing Chinese demand for soy and beef, and the direct and evident impact of Chinese enterprises on the Amazon,[237] a direct mention of farming would have been beneficial.

The rest of the world

Other countries with significant impact on global forests, particularly Japan and India, have not issued any kind of legislation in this sense. However, Japan has made strides in ensuring the legality of timber products, with mandatory due diligence coming into effect within two years as of May 2023, following the amendment of the Clean Wood Act.[238]

3.4 EU

3.4.1 Policies prior to the Green Deal

Before the Green Deal and approval of the EUDR, the EU did not have any specific regulation addressing the role of agriculture in deforestation. Since 2003, however, it has enacted a series of policies that would serve as the basis for the Regulation and that would define some of the key aspects that have been applied in it.

The most notable was the EU Timber Regulation,[239] which was enacted in 2010 to address the demand side of timber trade, and which was matched in 2013 by

The EUTR

the Forest Law Enforcement, Governance and Trade Regulation, focusing on producing countries. Both regulations were originally triggered by the FLEGT Action Plan; this is different from the homonymous Regulation and is instead an overarching framework that was endorsed by the Council of the EU in 2003 to promote the legal trade of timber and forest products and reduce the impact of EU demand in the sector on global forests.

Main EUTR elements

The EUTR aimed at blocking the entry of illegal timber and timber products on the EU market by imposing an EU-wide ban (which was absent before the EUTR) and by obliging the traders importing these products to trace their origin and observe a so-called "due diligence" to guarantee their legality. The FLEGT Regulation's objective was instead to work with timber-producing countries to reduce the factors behind illegal deforestation: corruption, destructive practices, unregulated markets, lack of certification processes and tracing mechanisms.[240] In this sense, it developed a series of "Voluntary Partnership Agreements" (VPAs) with partner countries that were meant to improve this collaboration and ultimately lead to the creation of FLEGT licensing schemes. While ten VPAs have been signed since 2009,[241] only two licensing schemes are in force at the moment (with Indonesia and recently with Ghana)[242] although with limited success.[243]

The different elements of the FLEGT Action Plan framework have indeed been the subject of a series of studies and evaluations – the most relevant being the 2021 Fitness Check on the FLEGT and EUTR – and their impact appears rather modest.[244]

Focus on legality

The EUTR was first limited by its focus on legality; the Regulation indeed did not consider sustainability criteria, but only whether timber imports respected rules in the producing countries. This significantly reduced the scope of the legislation and imposed on national European authorities the cumbersome duty to understand often complex and inaccessible legislation in countries such as Indonesia, Malaysia or Congo. Distinguishing between legal and illegal timber is also very complicated as illegal logs are often mixed with legal ones soon after cutting – a technique for smuggling illegal timber often called "log laundering" – and generally speaking the lack of transparency of the timber supply chain is particularly relevant.[245] The Regulation also uniquely dealt with timber trade while not considering agriculture-related deforestation, thus disregarding the most relevant factor affecting the phenomenon.

While these limitations have been at least partially addressed in the upgrade to the EUDR, some appear to remain. Like the EUDR, the EUTR relied on so-called "Competent Authorities" for its enforcement, both on the EU national side and in the partner countries concerned. Competent authorities have however been defined in a rather heterogeneous way across EU member states – some chose only agriculture or environment ministries (France, Spain), others also involved en-

Unresolved issues of the EUTR

forcement agencies (Italy) and others even custom authorities (Greece). This has made collaboration and exchange of information across competent authorities particularly lengthy and complicated (the EUDR does however dedicate some attention to information sharing in its text).[246] At first, the Commission also did not provide additional details on what due diligence was to consist of, and it became a rather vague concept that most operators did not know exactly how to translate into action. Finally, too little was done to prevent the illegal timber that the EU was rejecting from reaching other customers without such regulations, such as India or Japan, or even from re-entering the EU indirectly (for instance as furniture). A Bilateral Cooperation Mechanism had been developed with China already in 2009[247] to foster cooperation on FLEGT and EUTR but, although this may have inspired the 2019 revision of the Chinese Forest Law, there is no sign that this tool helped the implementation of the EUTR. No other agreement has been developed with other partners. The fact that these problems have somehow remained in the EUDR casts a shadow on the possible success of the new regulation.

3.4.2 Policies after the Green Deal: The Green Deal transition

The Green Deal breakthrough

Generally speaking, the launch of the Green Deal in December 2019 represented a major breakthrough in European environmental policies, in terms of both amount of the legislative proposals and the actual regulations it has delivered so far, as well as the radical new approach it proposed on sustainability. The Green Deal indeed adopted a comprehensive perspective on environmental topics, linking topics that had been considered separately in the past (environmental crimes and biodiversity protection, for instance), focusing also on the external component of environmental action (particularly regarding trade) and ultimately giving new relevance to issues that had traditionally been minor topics in the EU political debate – agriculture and the protection of habitats in particular. These changes ultimately set the stage for proposing and then adopting the EUDR – a complex, multi-layered regulation that would likely have had much less support in the pre–Green Deal Brussels environment.

Complementary legislation to the EUDR

The Green Deal enacted a series of regulations that share the same approach as the EUDR, although with different targets. Most notably, the Carbon Border Adjustment Mechanism has been launched with the objective of reducing the risk of carbon leakage, i.e., the shift of CO_2 intensive production outside the EU, towards countries with less stringent regulations (which would then import the product into the EU). Although dedicated to carbon-intensive industries, the mechanism shares with the EUDR the objective of regulating trade originating from outside the EU – and thus has similarly received opposition from EU trading partners, such as Brazil, China and the US.[248]

The von der Leyen Commission also extensively worked on agriculture on the domestic side; not only did it identify the so-called "Farm2Fork" as one of the eight

areas of action of the Green Deal (covering both farming and nutrition), but it also performed a complicated (and to some extent still very limited) reform of the Common Agricultural Policy.[249] The launch of the new EU Biodiversity Strategy for 2030[250] and of a very ambitious Nature Protection Package (of which the much-contested Nature Restoration Law was finally approved in November 2023[251]) addressed the conservation aspect. While all of these are domestic policies that do not directly address international trade, they set up standards that increase perception of the solidity of the EU's external environmental action.

The new ECD

The piece of legislation that has probably the strongest relation to the EUDR is the revised Environmental Crime Directive, an updated version of the 2008 Directive[252] that was proposed by the Commission in 2021[253] and was finally approved in November 2023.[254] Since its 2008 version, the legislation has aimed at stretching the application of criminal law also to environmental offenses – a sector which has been historically neglected by national laws – and more widely to empower environmental enforcement across the EU. The revised version has a significant focus on forestry, which was totally absent in the previous Directive; not only does it include the "illegal trade in timber" as one of the nine key offenses added in the new text, but it also includes a strong reference to the EUDR itself. Point "n" of Art. 3 indeed demands that member states treat violations to the EUDR as a criminal offence, to be prosecuted accordingly and proportionately (another key goal of the new Directive being rising penalties for environmental offenders). In this sense, the Directive will likely act as the strong arm of the EUDR, by allowing the use of criminal law to enforce the Regulation, a fact that could significantly empower it. Nevertheless, the revised Directive has only recently been approved and will not enter into force before the spring of 2024,[255] and then it will also need two more years (at least) to be implemented by member states. As in the case of the previous Directive, almost all the enforcement activities are left to the national level and there is still a relevant amount of discretion in the implementation of rules. The success of the new Directive (and thus its relevance for the EUDR) will then rely upon the effectiveness of the new sanctions proposed, but also largely on the capacity of member states to quickly and properly integrate them in their penal codes, as well as on the ability of the Commission to further coordinate action on environmental crimes (through, for instance, exchange of data and information and the work of agencies such as Eurojust and Europol).

3.5 FOCUS EUDR

The EU's Regulation for Deforestation-free Products[256] is the most important piece of legislation ever enacted in relation to deforestation governance in the EU, and likely the most ambitious on the global level as well. Proposed in No-

vember 2021 and finally adopted in May 2023,[257] the Regulation builds on the EUTR approach, extending it to six other commodities and significantly changing some aspects of its approach.

3.5.1 Approval process and subsequent debate

Preparing for the EUDR

Following the limited impact of the FLEGT Action Plan and the growing need for effective legislation in forest governance, a revision of the FLEGT/EUTR ecosystem was expected at least since the Juncker Commission. Not by chance it was at the end of the Commission, in July 2019, that the "Communication on stepping up EU action to protect and restore the world's forests" was published;[258] while the document was still very general, it introduced the idea of encouraging "the consumption of products from deforestation-free supply chains"[259] (the first Priority highlighted in the document), which would ultimately end up being the core of the EUDR. Some of the other main elements of the Communication were included in the new Regulation such as the creation of an "EU Observatory on deforestation, forest degradation, changes in the world's forest cover and associated drivers" (introduced as part of Priority 5 of the Communication), while others were left aside – for instance the Communication has a strong focus on finance which is totally missing in the EUDR. Most notably, the two items differ in the fundamental approach they express: while the Communication has a remarkable multilateral perspective, proposing a cross-cutting cooperation between partners and players, the EUDR clearly and almost solely promotes a unilateral approach.

The negotiation process

After the 2021 Commission's proposal, negotiations between the Council and the European Parliament took roughly a year and a provisional political agreement was reached on 6 December 2022.[260] The political debate was substantially smoother than other environmental regulations that were discussed during that time or shortly after, such as the highly divisive phase-out of the internal combustion engine, and it received significantly less media attention (at least in Europe). The Regulation will come into force 18 months after its adoption, i.e., by 30 December 2024; SMEs will however benefit from an additional six months and will be subject to the Regulation only from 30 June 2025.

The opposition of trading partners

Unlike on the domestic side, the EUDR has stirred a heavy response from several EU trading partners since its approval. Indonesia and Brazil have been the first and most vocal opponents, which were then joined by other 15 countries from the Global South in a protest letter to the World Trade Organization.[261] The EUDR has yet to be fully implemented, however; while changes to the legislation are not likely to happen anytime soon, the EU still has to publish a risk evaluation on partner countries, which is a key component of the Regulation but also likely to generate even greater backlash. The EUDR also already comprises elements for its expansion; by 30 June 2024, the Commission will have to present an impact assessment which could lead to extension of the Regulation to what is indicated

as "other wooded land". According to the text of the Regulation, after June 2025 the EUDR could also be extended to other natural ecosystems of high biodiversity or carbon stock relevance, such as peatlands and wetlands, so as to avoid the spillover of habitat destruction from forests to other ecosystems.

3.5.2 Approval process and subsequent debate

Main scope

The scope of the Regulation is to prohibit placing on the EU market agricultural commodities that have caused deforestation (the conversion of forest into agricultural land) or forest degradation (the conversion of natural forest into plantations or other wooded land). The EUDR also forbids the export of such products, excluding the possibility for member states to be transit countries in such trade. Commodities should also be produced in accordance with national laws of the producing country in order to be imported to the EU.

These elements already mark a significant difference from both the EUTR and most of the existing certification schemes. Unlike its predecessor, the EUDR not only focuses on the legality of the product but also on its sustainability, even if strictly from a forest perspective – there is no mention of pesticide pollution, for instance, or other kinds of environmental impacts of agriculture. Human and indigenous rights are frequently mentioned in the Regulation, but the scope of the EUDR is wholly on forest protection.

Commodities covered by the EUDR

The EUDR covers seven commodities (cattle, cocoa, coffee, oil palm, rubber, soya and timber) and their so-called "relevant products", i.e., anything that has been produced using one of the commodities and has been included in the rather detailed list of Annex I to the Regulation, such as soya bean flour or oil, furniture, and food preparations containing cocoa. Similarly to the EUTR, it revolves around the concept of due diligence which, also in this case, translates into three different requirements: operators must collect information, data and documents, produce a risk assessment and adopt risk mitigation measures. Indeed, even in this case it is the operator who ultimately puts the product on the EU market who bears the responsibility for compliance with EUDR rules, and is expected to collect the required information and manage the different players in the supply chain.

Cut-off date and penalties

The EUDR also establishes 31 December 2020 as the "cut-off date", i.e., the day since when deforestation activities are considered relevant to the Regulation. Interestingly, the Regulation identifies a time that was well prior to its entry into force; according to the text of the EUDR this is to avoid an acceleration of deforestation before the cut-off date.[262]

Penalties are similar to the EUTR – fines proportionate to the impact on the environment and the value of the product, confiscation, exclusion from the EU market – with the notable addition of a ceiling for the maximum fine that can be imposed

on offenders (4 per cent of their total Union-wide turnover). Concerning enforcement, the Regulation relies again on competent authorities. They are supposed to be nominated by member states by 30 December 2023, and are tasked with performing regular checks on operators to see if they are fulfilling their obligations, using a risk-based approach. In addition to general criteria to be applied when choosing the operators to monitor, such as their history or the complexity of the supply chain, according to Article 16 of the Regulation competent authorities will have to do more inspections depending on the risk level of the country: they will have to check 3 per cent of all operators importing from average-risk countries, and 1 per cent and 9 per cent respectively for low-risk and high-risk countries.

Categories of risk for partners

The main novelty is indeed the risk classification system that the EUDR introduces; it divides (or will, when the list becomes available) trading partners into three categories (high, average and low risk), expecting different due diligence requirements for each one. These evaluations will be done by opening a direct dialogue with the country concerned and "taking into account the latest scientific evidence and internationally recognised sources"[263] detailing production trends, the expansion of agricultural land for the commodities considered, as well as the rate of deforestation and of forest degradation. In addition to this, the Regulation also introduces an "access to justice" option[264]; under the EUTR third parties, such as NGOs, were able to submit "substantiated concerns" to demand checks by competent authorities, but their decisions could not be contested – an option which is now guaranteed by the EUDR.

3.5.3 Critical points of the EUDR

Benefits of the EUDR

When the EUDR was launched EU institutions highlighted a long list of direct and indirect benefits that the Regulation would have on forests, but also on communities living in forests and on the reduction of greenhouse gas emissions.[265] Ultimately the aim of the EUDR is to lay the foundations for an effective tracing and enforcement mechanism that other countries could also adopt – something like this happened with the EU Emission Trading System (EU ETS) and the EUTR itself, which have both been followed by similar Chinese regulations a few years later. This could represent a major breakthrough in environmentally friendly trade, since no other regulation like this has ever been approved on the national or international stage. Importantly, the benefit is not only to global forests; the EUDR is also a potentially powerful tool for the EU's trade and environmental diplomacy, since it gives in theory some unilateral control over a good range of its most salient imports, with not only a direct impact on customers (as in the case of coffee) but also on its agrifood industry (e.g., palm oil, soy).

While the ambition of the EUDR is great, many critical points still need to be addressed so that the system can function without a major backlash from trading partners and a significant cost to European consumers and operators, all while

Critical points

achieving the challenging environmental objectives it proposes. A revision of the Regulation is unlikely, but its implementation is already offering a series of occasions on which the EU could mitigate or readjust some of its features: between August and September 2023 Indonesia and Malaysia launched a taskforce with the EU to discuss implementation of the Regulation for palm oil (such as details concerning the inclusion of smallholders and the role of certifications),[266] while in November Brazil stated that the Mercosur negotiations could be an occasion to debate the EUDR and its impact on European and Brazilian operators.[267]

3.5.4 Reducing unilaterality

Avoiding conflict with trading partners

Mitigating the unilaterality of the EUDR could prove positive from a number of perspectives. The shift from the multilateral perspective of previous forest governance policies has been likely caused by the time consumption and the very low effectiveness of tools such as VPAs, which sometimes took years of negotiations to be signed, often stalled and whose implementation has been lagging in most cases.[268] While the process behind the EUDR has been much smoother, trading partners such as Brazil and Indonesia have felt that EU legislation has been imposed on them, without the benefit of consultation, and have fiercely opposed it.[269] The EU relies on its market power to have countries support the enforcement of the Regulation, but this will require an extensive, pervasive cooperation also on the ground, which antagonised countries are not likely to offer. The EU should also not overestimate its market power on these commodities; while holding a significant share of imports, its importance in some sectors and in relation to some partners is being overshadowed by other players. This is the case for instance concerning soy in Brazil, with China now being the most important buyer since surpassing the EU circa five years ago,[270] or palm oil from South East Asia, which is now primarily directed towards China but also India.[271]

The need for cooperation with third countries

In theory the EUDR contains a section focused on "Cooperation with third countries",[272] which names some of the tools that proved effective under the FLEGT Action Plan, such as integrated land use planning processes, support for the development of national legislation and multi-stakeholder processes. However, unlike the FLEGT Action Plan, where these measures were laid down before the publication of a Regulation imposing coercive rules (the EUTR), these have yet to be put into practice by the EUDR, and it is not clear when and how this will happen. Cooperative tools could instead hold the key for reducing the opposition of partner countries by reducing the compliance costs of the Regulation and by addressing the root causes of deforestation and forest degradation – which is what the Regulation ultimately needs in order to be successful.

Working in partnership with trading partners will be fundamental also for enforcement, whose responsibility is left to competent authorities in member

Supporting enforcement

states, which would however operate only in their own territory. Without the possibility to perform checks in producing or storage facilities in production countries, their work will rely solely on examining documentation (which could be however very complicated, since it requires significant expertise on different commodities and supply chains) and on the support they may receive from authorities in the producing country (which has proved low even for well-established cooperation under VPAs or FLEGT licensing). Checking shipments of commodities only from the EU, facing hostile authorities in partner countries, could transform the whole Regulation into a very expensive exercise of bureaucracy.

3.5.5 Addressing specificities

Variety within countries

The EUDR goes a step further than the EUTR by providing different risk evaluations, but it remains a very general piece of legislation that aims at regulating global commodities whose supply chains are significantly different from each other, and that often vary between and even within countries. The palm oil sector in Indonesia is completely different than the country's coffee production, which in turn is totally disparate when compared to its Brazilian equivalent. Furthermore, different regions inside the same country can have a very different production chain and levels of deforestation risk; coffee produced in the Bahia or in the Amazonas states of Brazil could be somewhere between medium and high risk, but that produced in Minas Gerais, where most of the production is located and where the natural forest had largely disappeared already by the mid-1900s, could be instead considered low risk. Applying a "medium risk" label for Brazil as a whole could be dangerous in both senses, by demanding expensive checks on producers that should not require them, but also by not performing enough audits on areas that are indeed at high risk.

The difficulty of including heterogeneity

Addressing these challenges can however be very complicated for the EU. Risk evaluation will already likely be the most arduous aspect for external acceptance of the Regulation, because no country with a solid trade partnership with the EU will easily accept a "high risk" evaluation despite alarming data. Indonesia has often denied satellite evidence over palm oil deforestation and so did Bolsonaro's Brazil over the increase in the rate of logging in the Amazon. It will be even more complicated for the EU to understand (or agree on) regional differences within countries, especially if we consider also countries where ethnic and political differences among different areas are strong (as in the case of Indonesia).

The solution proposed by the EUDR lies in the "national criteria" that the Regulation specifies should be applied by competent authorities to choose the suppliers to check, and that offer a much wider array of variables than the simple three-tier risk evaluation; competent authorities could decide to check suppliers from high-risk provinces instead than those from low-risk areas, for instance. However, by leaving this to member states, the EU has on the one hand likely

National criteria

saved itself much trouble, but at the same time it could have produced a loophole that could undermine the effectiveness of the whole Regulation. Different member states will likely choose different criteria, with little to no coordination among them; operators will then determine the weakest entry point into the EU, and proceed to sell the product across the bloc. Only efficient coordination by EU institutions, perhaps through some of the tools already included in the EUDR (such as the Observatory), could likely counteract this problem.

3.5.6 Uncertainty and confusion over implementation and costs

Short term uncertainty

The strong debate over the EUDR among players in the sector has also created significant confusion in many trading partners of the EU; in a series of interviews, several certified coffee producers in Minas Gerais (Brazil) were worried about an EUDR ban on glyphosate (which is totally outside the Regulation's focus) and had a confused understanding over what the Regulation considers "forest" and "deforestation"[273] (although definitions are relatively simple in the text). In some cases they feared the Regulation would consider recently reforested land with low-height trees or a timber plantation as forest (instead it is considered as "other wooded areas"). Some Brazilian coffee buyers in the same region admitted not having shared the EUDR cut-off date so as not to scare producers, also considering the possibility of an implementation or negotiation phase that many believe could still saliently change the Regulation.[274] This idea is also popular in Indonesia as well, especially because of the creation of the palm oil task force with the EU.[275] These could seem trivial mistakes, but they are affecting the business choices of often very large farms in core regions, eventually taking them away from trading with Europe. This would have been easily avoided through an early involvement not only of partner countries, but also of at least the major EU operators for these commodities. This could have given clarity and reassurances which are being provided only months after its approval and not by EU institutions, but by a mix of civil society[276] and consulting partners[277] (with the notable inclusion of the German cooperation agency GIZ through its project SAFE).[278]

Cost of the EUDR

The EUDR will also have a significant cost, estimated somewhere between 157 million euros and 2.31 billion by SP Global.[279] The range is however still too wide to be reliable, and provides no clarity on how these costs will be divided among different operators in the supply chain (although the Commission's own impact assessment already states that operators placing the product on the European market will bear most of it).[280] Without coordination with trading partners, it will be likely that either European companies will pay this price, or the weakest link in the supply chains will (such as smallholders).

3.5.7 Supporting smallholders

The text of the EUDR has a consistently wider focus on smallholders than the EUTR. They benefit from some exceptions in the application of the Regulation

A tentative focus on smallholders

(such as the start date, which is six months later) and they are often mentioned throughout the text (particularly considering the five-year review on the impact of the Regulation on farmers, which will focus on smallholders). They have even been the only category to receive dedicated communication material published alongside the EUDR, since an infographic on smallholders was published together with the Regulation.[281]

An often unsustainable impact on smallholders

The rationale behind this very explicit focus is likely in answer to the widespread criticism that the EUTR penalised smallholders because of regulations being too cumbersome for them to comply with, and that the EUDR will do the same – to some extent, a likely event. The tracing mechanisms required by the EUDR are not too expensive – GPS geolocalisation can be done even with a cheap smartphone – but smallholders have little to no awareness on how to do this, and it is in any case the buyer who bears the duty of tracing the commodity. Planning and performing the localisation for thousands of farmers, as well as consolidating and sharing the data can however be cumbersome and complicated for a buyer who has no previous experience with this. As even a minor percentage of untraced commodity will make the whole batch not compliant with the EUDR, the buyer could then either decide not to risk it and sell the product to customers with no such requirements, thus depriving smallholders of access to the EU market, or pass through the cost of tracing onto them. Generally speaking, EUDR requirements are not particularly complicated, or more detailed than what is usually required by certification schemes, but they are perceived as distant and complicated and, by affecting everyone without giving a chance to participate in the debate, to some extent unfair. Exceptions for smallholders in the EUDR are a welcome addition, but such exceptions are few in number; no particular effort has been made to close this very evident gap and to understand how to properly include smallholders in the Regulation (particularly considering that the EUTR Fitness Check made evident that this was a big issue for the legislation).

Positive spillovers in supporting smallholders

Giving smallholders a much greater role in the Regulation will however have a number of advantages. It will be a way to spread much-needed tracing requirements also to players that have been excluded from certification schemes using mechanisms that now, thanks to technology advances, are also relatively cheap. The geolocalisation requirement could also improve the land tenure of smallholders and, generally speaking, giving them a recognition in global supply chains where they have been largely unconsidered despite their importance.[282] The solution to achieve this is, again, the missing "partnership" component of the EUDR, which indeed significantly concentrates on smallholders, and which perhaps will be expanded in the implementation phase.

3.6 GREEN FINANCE AND INSTRUMENTS FOR THE PRIVATE SECTOR

3.6.1 The need for a new focus on finance

Lack of transparency in finance

While the attention of the EUDR and of most certifications lies only on the supply chain, one of the main elements triggering deforestation is the still-strong availability of financial resources to high deforestation risk projects. The majority of financial institutions do not have deforestation criteria for their investments; as a result, in 2022 financial flows towards companies driving deforestation through agriculture were estimated at 6.1 trillion USD.[283] If not properly tracked, financial initiatives that combine climate objectives with agricultural subsidies risk directing forest preservation funds towards companies that use destructive practices; public funds destined to agriculture, forestry and land use can still cause forest loss, if implementation safeguards are not in place.[284]

Insufficient sustainable finance

Paradoxically, reducing the impact of agricultural activities on forests faces the double problem of reducing access to finance for damaging initiatives, but also of funnelling enough funds to sustainable projects. Even if total investments for forest preservation have grown since 2015, the sector still faces important funding constraints. Projections estimate that 427 billion euros per year globally will be needed to reduce deforestation on a scale necessary to restore global forests and avoid runaway climate consequences; but total pledges for forest finance by various governments, financial institutions, companies and foundations have totalled only 26.8 billion euros for the period 2021–25.[285]

Another problem is a lack of operationalisation strategies. Long-term goals related to green finance were established in 2021 with the Glasgow Leaders' Declaration on Forest and Land Use, which pledged to align financial flows with the goal of reversing forest loss and degradation; the 141 signatories countries[286] have promised 11 billion euros up to 2025.[287] However no practical mechanism on how to mobilise a constant flow of funds or how to coherently channel them has been put in action.[288]

Moreover, forest finance commitments are often bundled with broader funds related to biodiversity protection and nature-based solutions in the agriculture sector. Categorising these pledges together may generate ambiguity on what the funds were effectively spent on. Therefore, there is a risk that large pledges covering multiple issues, among which forest conservation, will be counted as directed entirely towards forest protection, resulting in higher total estimations.

How to track results?

There are also challenges in tracking the state of these commitments, mainly due to their multiyear implementation, scarce reporting and lack of transparency. COP27 tried to address these issues with the launch of the FCLP, an innovative

model to enact concerted initiatives by governments, corporations and local players, which also calls for annual meetings and the publication of an annual global progress report to verify the status of different pledges.[289] Building on this, at COP28 16 countries announced the Joint Statement on Climate, Nature and People, as an effort to increase finance to reverse forest loss, improve data reporting on these issues and ensure the participation of indigenous people and local communities on initiatives to decrease deforestation.[290]

3.6.2 Green and climate finance

Generally speaking, the landscape of green finance has also seen significant developments in the last years. Attempts to direct financial flows towards climate change mitigation may indirectly slow deforestation, as agriculture and land use in forested areas are main factors in global emissions. Furthermore, many financial schemes trying to offset CO_2 emissions use reforestation and forest conservation as tools, increasing the link between climate finance and action against deforestation.

Climate finance

Climate finance has expanded since the Paris Agreement in 2015, reaching an average volume of 1.18 trillion euros annually;[291] public finance remains its largest share, with multiple declinations at various levels, with national, EU and UN schemes however not always perfectly aligned. Some of these climate funds have been designed specifically for forest finance, mobilising investments for forest conservation, for example by providing loans and facilitating credit access to farmers who adopt sustainable practices.

Regulating finance

Financial regulatory frameworks have also been innovated, with the EU establishing the green taxonomy, a categorisation to certify investments as sustainable. Among the environmental criteria, the taxonomy has also emphasised the alignment of investments with sustainable forest management, ensuring that forests are managed responsibly and that their biodiversity is protected.[292] Between 2010 and 2020 the EU has also helped mobilise over 1.5 billion euros in private and public investments for projects contributing to the restoration of about 600,000 hectares of forest through loans from the European Investment Bank (EIB). It has also committed about 220 million euros to venture capital funds to support the adoption of sustainable forest management practices and to offset emissions caused by deforestation.[293]

Development banks

Multilateral development banks have also increased their stakes in forest finance. For example, the European Bank for Reconstruction and Development (EBRD), in partnership with the Climate Investment Fund (CIF), has initiated the Forest Investment Program.[294] This programme has successfully mobilised 704 million euros to assist developing nations in their efforts to curtail deforestation and forest degradation.[295] By providing scale-up financial support, the programme

has encouraged forest and agricultural practices aligned with targets set through national REDD+ strategies and similar approaches indicated by the OECD. The Forest Investment Program is currently operational in 23 countries, including Brazil and Indonesia.[296]

3.6.3 Private and philanthropic finance

In recent years, initiatives for private and philanthropic finance for forest conservation have grown in volume. In 2021, the Forest Tenure Pledge, a project sponsored by private foundations, pledged 1.55 billion euros by 2025, while in 2022 Forest, People and Climate, a coalition of philanthropic organisations, announced a target to mobilise 1.09 billion euros to support global forests by 2027.[297] However, it remains difficult to quantify and track the precise figures disbursed by these organisations as they often rely on self-reporting.[298]

Initiatives by companies

Some companies that operate in the supply chains of the main deforestation commodities have adopted financial mechanisms to directly mitigate deforestation externalities. For example, in 2022 Nestlé financed the restoration of 2.8 million trees in Côte d'Ivoire and Ghana to offset the forest loss of cocoa production.[299] Unilever, Mars and Danone have also started to direct funds to growing trees on their suppliers' farms; however, reports on the size of reforested areas have not been produced.[300]

Financial companies have taken similar actions trying to finance deforestation-free supply chains. For example, JP Morgan Chase & Co. has launched an Action Bond programme that will support reforestation, committing to finance more than 1 trillion euro in green financing over the next ten years through blended finance and green bonds.[301]

The evolution of financial mechanisms for forest conservation and forest emissions reduction has been another element of innovation in the climate finance landscape, with the consolidation of forest credits as the main offsets in carbon markets (see section 3.8.5).[302]

Fully private forest finance initiatives

Though rare, there are also examples of fully private forest finance initiatives. The Natural Capital Investment Alliance, launched in 2021 by HSBC, Lombard Odier and Mirova, aims to scale up finance for natural capital management and preservation. NCIA members have pledged 7.3 billion euros to enact strategies in the fields of land restoration and forest protection, combining this funding with technical capabilities of experts from the Natural Capital Platform. However, despite the ambition, they have not offered an implementation timeline or a status report since the launch.[303]

3.7 DERISKING STRATEGIES IN AGRICULTURAL SUPPLY CHAINS

The risk premium paid by sustainable projects

Despite these advancements, the main problem that private actors face is how to contribute to sustainability while remaining competitive; however, investments to increase sustainability in supply chains are deemed as high-risk, because by assuming the costs of deforestation externalities they reduce profitability.[304] Furthermore, farmers who adopt sustainable practices for the first time are perceived as an even higher risk; if investors do not have examples of their previous results they may doubt their skills, productivity and cost, affecting their projected profits.[305]

Derisking strategies

Derisking strategies may reduce this exposure, allowing investors to secure profitability when loaning to or financing farmers who adopt sustainability practices to reduce deforestation externalities. Derisking for agricultural supply chains has indeed become a fundamental element to mobilise resources, as it allows to coopt risk-averse investors, and the efforts are also involving governments and international institutions. Governments particularly can deliver legislative frameworks that increase transparency in the supply chains and allow investors to assess which companies have adopted environmentally friendly practices. For example, the German Supply Chain Act prescribes that companies must identify and assess their risks in their supply chains, and then take measures to minimise damages to the environment.[306]

Private actors also have strong-vested interests in reducing vulnerabilities in the supply chains and in developing derisking strategies; as risks are present at any level of the supply chains, derisking strategies have to involve firms operating at any step. Companies focusing on production will have a different risk perception than those operating on processing, trading, manufacturing or retailing. Multi-sector involvement may allow for the identification of specific vulnerabilities and how to address them.

3.7.1 Different forms of derisking

Different types of derisking

Derisking strategies may take various shapes. Blended investment models and partnerships are gaining traction as a way to minimise risks, such as integrating approaches that combine producers and financial actors in the agricultural sector while strengthening multi-stakeholder and public-private partnerships. For example, the Ghana Federation of Forest and Farm Producers (GhaFFap), launched in 2020, is a multi-stakeholder platform that includes 12 organisations, such as Abrono Organic Farmers Associations, Innovations for Sustainable Rural Development, and Community Action in Development and Research, together reaching one million small producers.[307] Through a collaboration with FAO and the Ghana government, GhaFFap also launched the Green Ghana and Charcoal

Producers in Forest Landscape Restoration initiatives that focused on facilitating access to financial markets and on the creation of financial schemes using villages funds to adopt the sustainable transformation of production and assisting farmers to qualify for loans.[308]

Credit guarantee schemes

Credit guarantee schemes are among the most practical tools to address the financial risks of agricultural supply chains. These instruments enhance lending attractiveness by mitigating or sharing risks linked to loans.[309] The EU has experimented with this system: the InvestEU Fund has created a guarantee of 26.2 billion euros (with 9.9 billion directed towards sustainable investments) that is expected to generate up to 372 billion euros in public and private investment; the involvement of implementing partners such as the EIB is also expected to greatly increase the risk-bearing capacity of investment recipients, which would also benefit from the EU financial institution's high credit ratings.[310] The EIB has adopted this model of loan guarantees for small farmers and small and medium companies, as well as larger initiatives such as Afforestation and Erosion Control in Turkey (for 150 million euros) and Althelia Climate Fund operating in Africa and Latin America (for 25 million).[311] Another derisking tool is assessment of financial impact. This tool, together with the establishment of environmental criteria to access financing, would allow investors to prioritise those opportunities that share the best profitability/forest protection ratio.

Assessment of financial impact

The use of assessments of financial impact should allow financial institutions to determine if companies are using the received funds in a way that respects environmental criteria. In parallel, disclosure of intermediate and final targets and mechanisms to track how funds have been allocated in relation to the criteria may also allow investors to track the impact of their capital. For example, Norway's Government Pension Fund Global (GPFG), one of the largest financial players, has collaborated with the Rainforest Foundation Norway to assess the impact of its investments in companies that cause deforestation, specifically in palm oil production in Indonesia and beef in the Amazon. As a consequence of the evaluation, the GPFG has disinvested 280 million euros from 23 companies that used destructive practices and it has set higher standards to evaluate how to direct their investments.[312]

3.8 OTHER TOOLS FOR THE PRIVATE SECTOR

3.8.1 Corporate due diligence

Due diligence

Generally speaking, companies apply the so-called "due diligence" when they address their operations' contribution to any form of rights violation, labour exploitation and environmental damage. This should lead to the future prevention of these negative impacts, possibly tracking implementation and results of any measure

adopted. It could be compulsory (as in the case of the EUDR), but also voluntary, and in this sense it could translate into a positive tool for reducing deforestation.

Indeed, in the case of extractive sectors and agricultural commodities, deforestation is predictably one of the main negative impacts assessed by firms operating in the supply chains, particularly concerning the seven EUDR commodities. Companies may not even be directly responsible for such consequences, but they might rely on supply chains that are intrinsically built on them, for example sourcing raw materials from firms that do not guarantee deforestation-free activities. This makes impact assessments of due diligence difficult to frame. A company may acquire land that has been cleared through illegal deforestation practices by another party, making it difficult to determine who has been responsible for the deforestation process.

Voluntary due diligence

A very limited number of companies are applying this due diligence outside the compulsory requirements of regulations such as the EUDR. Among the 500 global firms more linked with production and processing of deforestation-embedded commodities, only 50 appear to have been monitoring their own supply chains for deforestation externalities and disclosing related information – among them Adecoagra, Amaggi, Dai Nippon, Nike and Nestlé.[313] Control and reporting are also often only partially reliable, because verification procedures may rely on data provided entirely by the company. These issues are a consequence of the voluntary nature of these commitments and ultimately create an intricate landscape where it is also difficult to assess best-practice players.

3.8.2 Regulating due diligence

Compulsory due diligence outside the EU

Outside the EUDR, governments' action to regulate disclosure of corporations' contribution to deforestation is absent or embryonic, with only the EU, UK, Germany and Brazil advancing proposals to transition from voluntary to mandatory reporting. The EU has proposed to strengthen corporate disclosure with the Corporate Sustainability Due Diligence Act which, if approved, would prescribe companies with more than 150 million net turnover in the EU to respect due diligence requirements, among which are deforestation and environmental criteria. Similarly, the UK is considering adding deforestation-related due diligence provisions to the Environment Act of 2021, which already regulates companies to disclose risks to air quality, water and biodiversity.[314] Germany has instead required mandatory due diligence covering many environmental risks through the Act on Corporate Due Diligence Obligations in Supply Chains.[315] The Federation of Brazilian Banks (FEBRABAN) has for its part announced a regulation that would require due diligence checks to evaluate financial contributions to companies linked with illegal deforestation.[316]

Large firms are also being pressured by consumers and investors to take measures against their role in deforestation, facing backlash and reputational

damages when avoiding making commitments. For example, in 2019 some investing firms including Aviva, Legal & General and BNP Paribas Asset Management released a statement asking companies in the soy sector, such as Bunge, Cofco and Cargill, to demonstrate commitment to eliminate deforestation from their supply chain[317] – this mostly because of the risk of consumer boycotts.

Consumers' awareness

Customers' awareness can indeed become an important determinant for capital allocations, making investment in a specific region or sector less desirable. Similarly, financial institutions are also looked at for their contribution to deforestation and a number of them are adopting internal guidelines to only direct investments towards operations that respect selected sustainability criteria.[318] The Finance Sector Deforestation Action, for example, is a coalition of financial institutions working to increase processes to identify and reduce risks of deforestation caused by financial operations.[319]

3.8.3 Private finance and public-private partnerships

Cases of successfull public-private partnerships

Public-private partnership models can also be effective in mobilising the necessary funds to fight deforestation, especially if designed by international players while at the same time combining the sector expertise of private stakeholders. For example, the Lowering Emissions by Accelerating Forest Finance (LEAF) coalition is a public-private partnership with the objective of mobilising funds to finance actions for restoring degraded and deforested land and advancing the adoption of agroforestry practices.[320] It includes large companies such as Volkswagen Group, Amazon and Bayer, countries like Norway, the United Kingdom, the United States and South Korea, and even subnational regions such as the Brazilian States of Amapá, Amazonas, Mato Grosso and Pará. The partnership originally announced a target of almost 1 billion euros, but at COP27 the objective was surpassed, reaching 1.4 billion.[321] At COP28, the LEAF coalition signed an agreement with Costa Rica and Ghana to buy forest carbon credits, verified through the REDD+ mechanism, which could generate up to 60 million USD for forest conservation.[322] This success sparked interest in the role that this model may cover in funding mobilisation. Another example of public-private partnership is the Agri3 Fund, a 280 million euro guarantee fund sponsored by Rabobank, a Dutch private investment bank, and the UN Environment Programme with the objective of mobilising capital to support sustainable agriculture practices and decrease deforestation. The Agri3 Fund aims at derisking loans and investments in agricultural supply chains generating up to 1 billion euro.[323] Combined efforts of public and private actors may also produce non-monetary tools for fighting deforestation. For example, in 2018 the United Nations Environment Programme Finance Initiative and the Natural Capital Finance Alliance launched the "Exploring Natural Capital Opportunities, Risks and Exposure" (ENCORE) tool as part of their partnership. This tool is designed to assist financial institutions in assessing the risks associated with deforestation, aiming to facilitate risk reduction in investment for forest protection.[324]

3.8.4 Carbon markets and carbon credits

Voluntary Carbon Markets

In addition to financial and derisking tools to address deforestation externalities, carbon markets have been used to push players to perform in ways that are both economically viable and promote a deforestation-free approach to agriculture. Voluntary Carbon Markets (VCMs) are still at an early stage, but they are quickly growing and can not only strengthen the role of forests as carbon sinks, but also their integrity in agricultural value chains. VCMs are separate from government-regulated carbon markets, such as the emissions trading scheme (ETS) in the EU, and they are entirely based on supply and demand for carbon credits by their participants. Companies, NGOs and even single individuals may participate in a VCM, with large firms like Google and Microsoft regularly using VCMs to align their emissions with their own sustainability targets. This large private involvement is increasing the value of the sector, which accounted for 1.85 billion euros in 2020 and it is projected to reach 46 billion euros in 2030 and 209 billion by 2050.[325] [326]

Functioning of VCMs

Unlike Compliance Carbon Markets, such as the ETS, participation in the VCM is voluntary and there are no impositions to offset one's emissions. However, corporate responsibility or consumer pressure may persuade private actors to participate in VCMs, buying credits to offset their emissions. VCMs use a project-based system in which there is no finite supply of allowances, but offsetting requires the addition of contributions, meaning that the removal or reduction of carbon must not occur without an offset project. Credits equivalent to the emissions reduction that the project generates are then sold by the project developers to buyers that want to offset their emissions, either directly or through a broker. Different private agencies, such as American Carbon Registry, the Climate Action Reserve, the Gold Standard and the Verified Carbon Standard, regulate the flow of credits supplied to the VCMs. They are responsible for defining project standards, verifying compliance and keeping track of creation and elimination of credits used.[327]

3.8.5 Voluntary Carbon Markets as a funding scheme for forests

Forest credits in VCMs

Forest credits in VCMs are relevant – in 2022, 127 million tonnes of CO_2 emission were avoided through carbon credits focused on forest conservation projects[328] – and are sourced from various activities: credits are produced through activities like afforestation and reforestation, consisting of projects for planting new trees which physically remove emissions from the atmosphere for a certain period, or forest conservation that prevents the loss of forested areas.[329] [330] Indeed, VCMs are primarily a tool to fight carbon emissions, but it has been shown that forestry carbon credits have been the most frequently chosen way to offset carbon emissions. Forest conservation and VCMs can therefore strengthen each other; by engaging private-sector investments, VCMs have been a relatively modest, although constant source of funding for forest conservation.[331]

These forest-based carbon activities can generate different types of credits. Removal credits are given when the project will absorb CO_2 from the atmosphere (as in the case of reforestation and land restoration). Emissions avoidance or reduction credits come instead from projects that lower emissions compared to a baseline scenario, such as the Improved Forest Management under REDD+ schemes. Historically, the majority of forest-based credits in VCMs have been emissions avoidance credits, primarily because removal activities demand more upfront investment and issue credits at a slower pace.

Beyond carbon credits

Nevertheless, there is an increasing emphasis on moving beyond reliance on carbon credits and short-term offsetting and towards more centralised carbon markets that would connect different players and frameworks. In 2022, during COP27, a public-private partnership to regulate and centralise the Voluntary Carbon Market was announced: this was the Energy Transition Accelerator, proposed by the U.S. Department of State, Bezos Earth Fund and Rockefeller Foundation, which tried to establish itself as the reference mechanism to purchase credits generated by high-end carbon reduction projects. Meanwhile, companies like PepsiCo, Microsoft and Bank of America have been among the private players pushing the most towards more centralised VCMs. In 2023, COP28 hosted international debates on how to better create standards for VCMs, which could contribute to centralisation, but no decision has been taken and the system remains highly decentralised and volatile.[332]

The demand for carbon credits in the Voluntary Carbon Market is driven by a diverse range of actors with varying objectives and remains in fact challenging to predict. Trends in issuances of forest-based carbon credits showed an increase until 2021, followed by a decline in 2022.[333] This is largely attributed to growing concerns about the quality of REDD+ credits, especially following investigations into the climate impacts of certain REDD+ projects, which have raised doubts about the effectiveness of these credits and thus are resulting in a decreased demand.[334]

3.9 CASE STUDY BRAZIL, SUSTAINABLE LOGGING IN THE TAPAJOS FOREST

OVERVIEW

Delivering sustainable timber has been historically a complicated issue, for Brazil but also for the majority of the timber-producing countries in the world, particularly in the tropics. Recent research states that up to 94 per cent of deforestation in Brazil could be illegal[335] and thus the timber export derived from this activity. This has affected the whole country but especially the Amazon and Cerrado biomes (i.e., the nine states where the Amazon is located and the 11 comprising the Cerrado). This despite the EU's attempts to fully implement the EUTR in the past decade and efforts by FSC and other certification schemes to spread sustainable logging and effective tracing. This has been due to a number of issues; awareness on sustainable forestry practices has been very limited, resulting in a lack of economic incentives, while low enforcement, low sanctions and the ease of laundering timber have promoted illegal production.[336]

The area now comprising the Tapajós Environmental Protection Area, part of the Amazonia biome in Parà state, has been no exception. From the 1980s significant blocks in the east and west of the area have been heavily deforested. Even plots in the centre have been cleared, thus separating the main Environmental Protection Area in the south from the part that is now distinctively called "National Forest of Tapajos". Illegal logging has continued recently, partially due to illegal mining[337] but also because of trade in illegal timber using counterfeited licenses.[338]

« The timber deposit of Coomflona

SOLUTION

Since 2005, the National Tapajos forest has been the testing ground for a sustainable community logging project by the cooperative Coomflona, which obtained an FSC certification in 2013.[339] The project covers 80,000 hectares, correspondingly roughly to 15 per cent of the total conservation area of the national forest, and involves 18 out of the 24 communities living in the area. The purpose is indeed to implement sustainable logging practices, guaranteed by FSC tracing and evenly dividing benefits and income across the communities belonging to the cooperative. Among the criteria applied in logging activities, Coomflona applies a rotation principle, according to which areas that have been logged are then monitored and not touched for 35 years. Logging is done according to principles of minimum impact forestry management, which translates into a variety of rules; circa four to five trees are cut per hectare (equivalent to 30 m^3 of wood), and the cutting is selective and done on different species, which are catalogued and accounted for through a digitalised system (called "SINAFLOR"), to avoid putting excessive pressure on only a few. The supply chain is relatively simple; timber is sold to an international trader and is then bought by international buyers (mostly European). This unlike other producers in the area, which sometimes collect timber also from other producers, thus increasing the risk of log laundering.[340] Five per cent of production is sold as timber products (furniture, kitchenware, etc.).

The project has taken roughly 15 years to deliver a full, effective management plan, and kickstarting costs have been significant.[341] While these have been covered in the past by grants provided by different international donors, the project has now reached the level of autonomous profitability.[342] Despite operational costs being greater than those of traditional logging activities, the project has proved the economic viability of a sustainable approach, and benefits to communities have been clear.[343] The selective approach has also allowed species to be chosen according to market demand, thus improving the profitability of the operation. Legal timber from Coomflona however still suffers from competition from illegal activities and from limited demand for certified products. The model proposed is nevertheless replicable, but its success will depend also on different geographical conditions and specific features of the forests where it is applied.[344]

Logging operations »
at Coomflona

3.10 CASE STUDY INDONESIA, COFFEE PRODUCTION NEAR THE BUKIT BARISAN SELATAN NATIONAL PARK

OVERVIEW

The Bukit Barisan Selatan National Park (BBSNP) is located in the south of Sumatra, in the West of Indonesia, and represents one of the most important habitats in the whole island. It is one of the few remaining lowland tropical forests in an area which has been heavily degraded in the past two decades because of agricultural production and coffee in particular. The park is a safe haven for the few remaining, critically endangered Sumatran tigers, Sumatran elephants and Sumatran rhinos (although the latter may have already gone locally extinct),[345] but it is also home to thousands of amphibian, plant, bird and insect species, many under threat of extinction. Yet, despite being officially protected since 1935, the park has suffered from illegal deforestation which continues to this day. Between 2000 and 2019 the park lost 81,000 hectares of forest (more than 25 per cent its total size)[346] and changes are still occurring; some 5 per cent of the total Robusta coffee production of Indonesia comes from illegal farms inside the park.

Almost all of this production comes from smallholders owning plots mostly of 0.5 to 2 hectares, who however have a limited knowledge of best agricultural practices and whose trees tend to be old and not maintained, thus decreasing their yield. Profitability is also limited by low access to finance and to fertilisers. This translates into further encroachment of the forest to expand production areas, since corruption and low enforcement make this a relatively easy and much cheaper task than making existing farms more efficient. This applies to cultivation both inside and surrounding the national park.

This situation also complicates implementation of the EUDR in relation to the production of coffee, the commodity that is exported the most from the area. A large portion of production is legal and is not causing deforestation, but the risk of mixing with illegal coffee is high, as collection is often done by small buyers. Geolocalisation is also complicated because of the difficult access to many farms, which are reachable only via offroad motorcycles and are often on steep slopes. According to Hanns R. Neumann Foundation (HRNS) staff,[347] the main concern about the Regulation is the risk that compliance costs will be passed through entirely to smallholders.

« A coffee farm near the Bukit Barisan park, from which it is separated from a buffer zone

SOLUTION

The BBSNP has been at the centre of several activities by the Wildlife Conservation Society (WCS) and by the HRNS for a few yeas now, particularly after the 2018 roundtable on the park organised by WCS. The latter focuses mostly on "in-park" interventions, focusing on wildlife protection and avoiding further encroachment, for instance by supporting enforcement through the creation of community patrols and the use of drones for monitoring. HRNS focuses instead on "out-of-park" strategies: improving local governance, the welfare of farmers and the efficiency of production, with the aim of offering incentives for farmers to focus on coffee cultivation in legal areas.

More in detail, the Foundation's action concentrates on a number of activities, some of which have already been tested in previous years: capacity building to implement best agricultural practices and to understand the value of ecosystem services provided by the forest (particularly in relation to water resources), sponsoring collaborative management and community forest management plans to increase the sense of ownership by locals through involvement in decision making. HRNS also works on the policy and legal side, not only through helping smallholders improving land tenure, but also to raise awareness and understanding of national and international processes – the EUDR among them.

According to HRNS staff,[348] a few elements are key for this to work. Communities are not very sensitive, and in some cases even hostile, to approaches based on conservation or environmental purposes. Economic motivations for the shift towards forest-positive agricultural practices are instead usually welcomed. It will be key then to offer economic incentives and preferred market access to farmers for these initiatives to work. Villages in the BBSNP area also tend to respond more positively to a softer approach that is more open to dialogue, rather than to stricter enforcement and draconian law. Ownership is equally important. Several communities have reached the area only in recent times – from the 1960s to the 1980s, when deforestation started in the park – and have a limited connection to the park. The situation is however evolving, also thanks to the work of WCS and HRNS; communities' understanding of the importance of the forest is growing, and encroaching in the national park is increasingly considered a reproachable practice. It is indeed mostly done by people coming from outside the community, the number of whom increased significantly during the COVID-19 pandemic.

Natural forest in the Bukit Barisan park »

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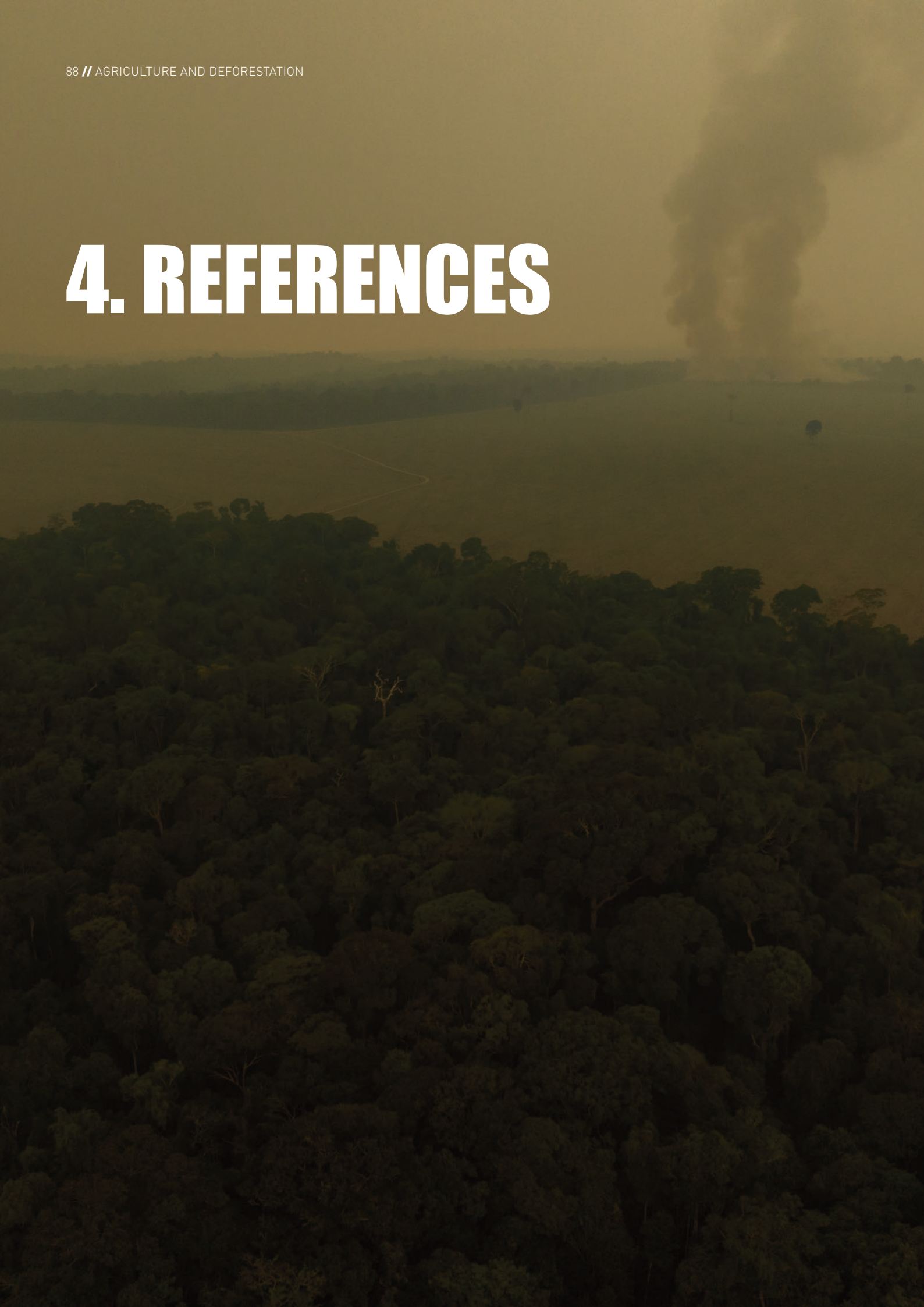

4.1 INTERVIEWS

Indonesia

Interview 1
Representatives from Hanns R. Neumann Stiftung (HRNS) in Sumatra. Sumatra, August 2023.
HRNS is a global NGO working on sustainable coffee farming, focusing on livelihood improvements, youth empowerment and environmental protection. It is currently leading a series of projects across Indonesia.

Interview 2
Representative from the Preferred by Nature office in Java. Java, August 2023.
Preferred by Nature is a global NGO working on traceability and sustainable agriculture. It is leading a series of projects in the field in Indonesia, also focusing on support for EUDR implementation.

Interview 3
Representative from the JPIKA office in Java. Java, July 2023.
JPIKA is an Indonesian NGO, focused on environmental investigations and traceability, working in particular on timber, palm oil and critical commodities.

Interview 4
Representatives from the Jikalahari office in Sumatra. Sumatra, August 2023.
Jikalahari is a local NGO based in the province of Riau, Sumatra. It started its work focusing on illegal logging but, following the disappearance of natural forests, it is now focusing on forest fires and illegal palm oil plantations.

Interview 5
Representatives from the Titian office in East Kalimantan. East Kalimantan, August 2023.
Titian is a local NGO based in the East Kalimantan province of Borneo. Among its activities, it focuses on forest fires and illegal palm oil plantations.

Interview 6
Bambang Saharjo, professor at the Bogor Agricultural University. Java, August 2023.
Bambang Saharjo is one of the leading Indonesian experts on forest fires caused by palm oil plantations and other companies. He is now an official expert witness for the Indonesian police, which he actively supports in investigations.

Brazil

Interview 7
Coffee producer in the south of the Minas Gerais region. Minas Gerais, October 2023.
A large producer, owning a farm between 500 and 700 hectares.

Interview 8
Coffee producer in the south of the Minas Gerais region. Minas Gerais, October 2023.
A small-size producer, owning a farm between 40 and 60 hectares.

Interview 9
Coffee producer in the south of the Minas Gerais region. Minas Gerais, October 2023.

« Deforestation and fires in the Amazon. Parà State, Brazil

A medium-size producer, owning a farm between 80 and 100 hectares.

Interview 10
Coffee producer in the south of the Minas Gerais region. Minas Gerais, October 2023.
A large producer, owning a farm between 600 and 800 hectares.

Interview 11
Representatives from Exportadora de Café Guaxupé. Minas Gerais, October 2023.
Exportadora de Café Guaxupé is one of the major buyers of coffee in the south of Minas Gerais, with a significant focus on sustainability and on capacity building to let farmers access the market for certified coffee.

Interview 12
Representatives from Coomflona. Pará, November 2023.
Coomflona is a cooperative that has been developing a successful model of sustainable and legal logging in the Amazon for the past 20 years. It is based in the state of Pará, in the city of Santarém.

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