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**Policy paper: Deforestation and  
forest degradation in coffee supply  
chains**

## Background

1. The Coffee Public Private Task Force (CCPTF) identified the need to prepare a neutral and independent policy brief to facilitate ICO Members' informed discussions on the topic of the new European Union (EU) regulation on deforestation-free products. The objective was to reach a consensus by focusing on the most critical factors/issues and exploring evidence and facts to decide how to engage with all coffee stakeholders and legislators, while taking into account the specific needs of coffee farmers, industry and consumers.
2. As part of a collaboration with the University of Wageningen, the International Coffee Organization (ICO) and its CPPTF then commissioned and financed this independent policy brief on the potential implications for the coffee sector and particularly smallholder farmers.
3. The attached policy brief reviews the main definitions and key elements of the EU deforestation regulation and concludes on its impact. It reflects the opinion and viewpoints of the authors at Wageningen University Research.

## Action

The Council is requested to note the Policy Paper submitted to the Council and agree upon any arising actions.



# Deforestation and forest degradation in coffee supply chains

A policy brief on the potential implications for the coffee sector and particularly for smallholder farmers of the European Union regulation on deforestation-free products

## FINAL DRAFT

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Wageningen Economic Research

Wageningen, March 2023

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# Executive Summary

This policy brief reviews the main definitions and key elements of the European Union (EU) deforestation regulation,<sup>1</sup> and concludes on its potential implications for the coffee sector, particularly for smallholder coffee farmers.

Changes to food systems are required to halt deforestation and forest degradation **to slow the rate of climate change and the threat to global diversity**.<sup>2</sup> Henceforth, the EU deforestation regulation aims to minimise the risk of placing products and commodities on the EU market that cause deforestation and forest degradation. The regulation proposes a benchmarking system, introduces the requirement of geolocation and traceability for each plot of land where the raw material was produced and determines a cut-off date for mandatory due diligence rules to be implemented. These due diligence requirements pose both challenges and opportunities for smallholder farmers. To prepare for its implementation, key aspects of the regulation and definitions must be understood to assess the implications for the coffee sector. This brief aims to facilitate informed discussions by International Coffee Organization (ICO) member countries and members of the Coffee Public-Private Task Force (CPPTF) and all coffee stakeholders, by focusing on those critical elements of the regulation that may create challenges when in place in producing countries. Such challenges are identified and analysed based on available data, scientific publications and reports. This brief also reflects discussions with the ICO team. Preliminary findings were presented in the 134th ICC and the 5th CGLF in Bogota, Colombia, where inputs and views were collected, especially from coffee producing countries. The information from these discussions is also reflected in this brief.

The EU regulation applies specific definitions to forests, deforestation, forest degradation and agricultural plantations, which may differ from (legal) definitions used in producing countries and may pose challenges in measuring deforestation (Chapter 3).

Coffee is incorporated into the regulation due to the term 'embodied deforestation,' which means there is an association between deforestation in a certain area or country and coffee production. The EU deforestation regulation provides clear definitions of forest and deforestation that will be applied in the regulation: While the term 'deforestation' is understood as the reduction in forest size, forest degradation is defined as the result of a more gradual process of biomass decline. While the conversion from forest to agroforestry is considered deforestation in the EU deforestation regulation, there is an overlap in the definitions of both regarding the structural characteristics of forest and agroforestry systems. Furthermore, how to distinguish a naturally regenerating forest that regenerates into a near-natural state, from those that turn into a managed coffee plantation? Because of this, it will likely be a challenge to measure whether deforestation occurred. Reliable estimates of deforestation should therefore go beyond tree cover loss and be randomly verified through field visits. Finally, a coffee farm could be managed within the legal boundaries of producing countries, while such management is seen as deforestation in the EU regulation.

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<sup>1</sup> Outcome of Trilogue negotiations proceedings: [REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of on the making available on the Union market as well as export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation \(EU\) No 995/2010. Interinstitutional File: 2021/0366\(COD\). 16298/22 Brussels, 21 December 2022.](#)

<sup>2</sup> Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. Target: 15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.

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The incorporation of coffee into the EU regulation is relevant, as the EU is connected with deforestation associated with coffee production (Chapter 4).

The coffee community has challenged the 7% embodied deforestation for coffee included in the EU regulation. Nonetheless, information suggests that the EU's demand for green coffee beans may be linked to deforestation in coffee-producing countries, which confirms the relevance of coffee to be included in the scope of the regulation. Moreover, as an important importer of coffee, the EU is responsible for 30-40% of the embodied deforestation for coffee, which is a larger percentage than for any of the other commodities included in the regulation.

Potential risk scores of deforestation and forest degradation are presented to guide countries in setting the agenda for action, and to support due diligence processes for coffee production where relevant (Chapter 5).

Guidelines on the country or parts of country benchmarking system and due diligence rules have not been released, and there is a lot of uncertainty about how to proceed and it will be the responsibility of the EU Observatory to provide real-time data on the state of the forests. We present potential risk scores of deforestation and forest degradation to guide countries in setting the agenda for action, and to support due diligence processes for coffee production where relevant. These risk scores provide a composite measure of environmental degradation, including deforestation, biodiversity loss and agricultural water risk. Agricultural deforestation is captured by commodity-driven deforestation as well as shifting agriculture, terms that capture two distinct processes driving deforestation and forest degradation. Commodity-driven deforestation (CDD) occurs in an area where long-term, permanent forest conversion to agriculture was detected. Shifting agriculture (SA) occurs where small- to medium-scale forest conversion to agriculture occurs, which is later abandoned, and where subsequent forest regrowth is detected. Due to the temporary nature of the definition of SA, it seems unusual in the context of coffee plantations where coffee trees can be productive for about 15 years. Nonetheless, SA could occur from smallholder livelihood activities prompting deforestation in coffee-producing areas even though not for coffee production itself. The potential risk of deforestation is mostly driven by SA, and we find high variability in deforestation between coffee-producing regions within countries. The information presented in this brief does not imply that deforestation currently occurs in the country but that there is a potential risk for deforestation based on historical evidence.

The requirements and due diligence processes in the regulation can potentially increase responsibilities and costs for smallholders (Chapter 6).

Many uncertainties remain on the implications for smallholders, given the lack of a production-side impact assessment. The requirements and due diligence processes in the proposed regulation can potentially increase responsibilities and costs for smallholders. The latest text of the Regulation is now more focus on the right of indigenous peoples, and there is now a direct recognition of the need for a living income. Nonetheless, there is no direct recognition of the risk that the new requirements might impose on 'regular' smallholders. The proposed regulation might create a market barrier that must be overcome to gain access to the EU marketplace, leading to a market distortion. As an additional import regulation, with its associated costs, it is expected to incentivise traders to source from fewer smallholders or regions with a lower risk of deforestation. Whether the regulation induces prices to rise sufficiently for the benefit of smallholder farmers such that they could cover such costs remains uncertain. The EU legislation may even push the production of materials for domestic consumption (or coffee destined for non-EU markets) into forest zones. It is not certain that coffee area expansion is necessarily the prime (or only) causal driver of deforestation. Rather, deforestation often is an outcome of a growing rural population seeking a (living) income by satisfying a rising demand for food in urban markets as a function of strong population growth in developing countries. Effective forest and biodiversity protection needs to

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consider concurrent drivers of deforestation simultaneously. This implies a vital role in the engagement of smallholder coffee producers and their organisations, as well as local governments, sharing information and data, capacity building and concerted action between public and private stakeholders from different sectors, especially to prevent any shifting of the problem to some other sector or place.

**Key messages**

- There is a strong need to conduct country level assessments on the readiness to fulfil the new EU legislation, and specially on how smallholder coffee farming families would be affected.
- To be prepared, producing countries and coffee farmers (and particularly smallholder farmers) and their producer organisations need timely information and capacity building on the regulation.
- Data requirements on geo-localisation and traceability need to feed a discussion on how data should be managed, by whom as well as on data ownership.
- Sector-specific guidelines are required, and for the coffee sector specifically, on how to differentiate between forest and coffee agroforestry systems such that coffee farm management is not seen as deforestation.

This paper was commissioned and financed by the International Coffee Organization (ICO) and its Coffee Public-Private Task Force (CPPTF). All views and interpretations expressed in this document are those of the authors and not necessarily those of the supporting or cooperating institutions or individuals.

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# 1. Why is urgent action needed to protect forests and how could the EU legislation contribute?

Transformation to 'nature-positive' systems is urgently required.

Climate change escalates with the lapse of time. It is a threat to human well-being and the health of the planet. Agriculture is responsible for 80% of global deforestation and a major cause of global biodiversity decline (WWF, 2020) and a primary driver of climate change (Curtis *et al.*, 2018; Pendrill, Persson, Godar and Kastner, 2019; Pendrill *et al.*, 2022). The urgency created by these circumstances requires concrete and immediate action to curb environmental consequences (IPBES, 2019; IPCC, 2022). Being 'nature-positive' means creating a world where the destruction of nature is halted and reversed (Locke *et al.*, 2021). The concept signals a paradigm shift in how countries, businesses, investors and consumers value nature (Mommer *et al.*, 2022).

The EU regulation aims to minimise deforestation and forest degradation practices within supply chains of products entering the EU market.

The urgency of the situation calls for urgent steps. Coffee is grown in areas with a high risk of deforestation, rich in biodiversity and with high (potential) carbon storage (Conservation International, 2022). The *'REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the making available on the Union market as well as export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing'* aims to minimise deforestation and forest degradation in selected agricultural commodities in areas at risk of deforestation, including palm oil, soy, wood, cocoa, coffee and beef (Council of the European Union, 2022).<sup>3</sup> While no commodities or raw materials from specific countries will be banned, companies placing products on the EU market must exercise due diligence to evaluate risks in their supply chain (European Parliament, 2022).

The due diligence requirements might pose both challenges and opportunities for smallholder farmers.

The rationale behind the regulation is to increase the demand and supply of deforestation-free products within the EU, encouraging sustainable practices at home and abroad, and thereby reducing deforestation. To do so, the regulation sets mandatory due diligence rules. The due diligence has several concerns. The requirements might pose significant challenges for smallholder coffee farmers apart from the foreseen opportunities. On the one hand, the regulation could entail, for example, additional costs and administration fees for coffee smallholders and their producer organisations to comply with new requirements and human rights impacts (Blot and Hiller, 2022; ClientEarth, 2022; Council of the European Union, 2022; Fairtrade International, 2022; Zhunusova *et al.*, 2022). On the other hand, it can build knowledge and social capital and reduce supply chain complexities (Blot and Hiller, 2022). It is also expected to fuel the trend towards sustainable sourcing practices and increased transparency, as well as a possible push for enhanced sector governance by all actors in global supply chains (IISD, 2022).

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<sup>3</sup> 'relevant commodities' means cattle, cocoa, coffee, oil palm, soya, rubber and wood; and 'relevant products' means products listed in Annex I of the Regulation that contain, have been fed with or have been made using relevant commodities (Council of the European Union, 2022).

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## Definitions must be understood to assess the implications of the regulation for the coffee sector.

The definition of forests in the legislation determines what is considered deforestation. Forest definitions usually include certain structural limits to classify an area as a forest. The FAO definition for forests is 'Land spanning more than 0.5 hectares with trees higher than 5 metres and a canopy cover of more than 10 percent. It does not include land that is predominantly under agricultural or urban land use'. This excludes tree stands in agricultural production systems, such as fruit tree plantations, oil palm plantations, olive orchards and agroforestry systems in which crops are grown under tree cover (FAO, 2020b). Countries and other jurisdictions, however, may have different definitions to determine what a forest is and, consequently, what is considered (illegal) deforestation. Since the definitions for forest may differ between countries, legal documents, etc., different (legal) contexts may result in different conclusions on deforestation.

## This brief provides an analysis of potential implications of the EU regulation to facilitate informed discussions on its implementation.

This brief aims to facilitate informed discussions by ICO member countries, members of the CPPTF and all coffee stakeholders by focusing on those critical elements of the regulation that may create challenges when in place in producing countries. Such challenges are identified and analysed based on available data, scientific publications and reports to answer the main research questions: What are the key elements of the EU regulation? (Chapter 2); How are deforestation and forest degradation defined? (Chapter 3); Why was coffee included in the EU regulation (Chapter 4); What are the potential risks of deforestation and forest degradation in coffee producing countries? (Chapter 5); What are the potential implications for smallholder farmers? (Chapter 6). This brief also reflects discussions with the ICO team. Preliminary findings were furthermore presented in the 134th ICC and the 5th CGLF in Bogota, Colombia, where inputs and views were collected, especially from coffee producing countries. The information from these discussions is also reflected in this brief.



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## 2. What are the key elements of the EU regulation?

### The regulation proposes a benchmarking system.

The benchmarking system assigns to 'third countries'<sup>4</sup> or parts of countries a level of risk related to deforestation (low, standard or high) based on the risk for all products in the regulation (Council of the European Union, 2022). The level of risk would determine the requirements and specific obligations for operators and member states' authorities to carry out inspections and controls (European Council, 2022). How countries and parts of countries are going to be classified and based on which methods is still not clarified. All countries or parts of countries will be classified as standard when the regulation comes into force. The classification will be updated no later than 18 months after the regulation comes into force. Most importantly, the level of risk will be determined based on the aggregated risk of deforestation from all 'relevant commodities' in the regulation, so even if the deforestation risk for coffee is low in a certain country or part of country, it must comply with high-risk due diligence when high-risk sectors are also produced in the country. The risk level assessment is aimed to guide dialogue and partnership between the EU and producer countries, with possible additional support for the 'high risk' category (IISD, 2022).

### The regulation introduces the requirement of tracing the geographic location of each plot of land where the commodity was produced.

The product, commodity, or raw materials should include information on the geolocation coordinates from the different plots of land where they were produced (Council of the European Union, 2022). Furthermore, it might require the name and virtual and physical address of all the intermediaries within the supply chain based on the proposal document (European Council, 2022). The intention of the EU in collecting geographic coordinates and personal information is to ensure the traceability of commodities entering the EU market. By providing the geographic coordinates of the agricultural plots, the land use can be remotely verified using satellites, and forest loss determined. However, guidelines and procedures still need to be established, and the coffee sector (as well as other sectors) must develop procedures on how the information will be managed, at what level (farmer association, local government, country level) and by whom (local authorities, traders, operators or small and medium-sized enterprises (SMEs)). Complexity and readiness vary a lot from country to country.

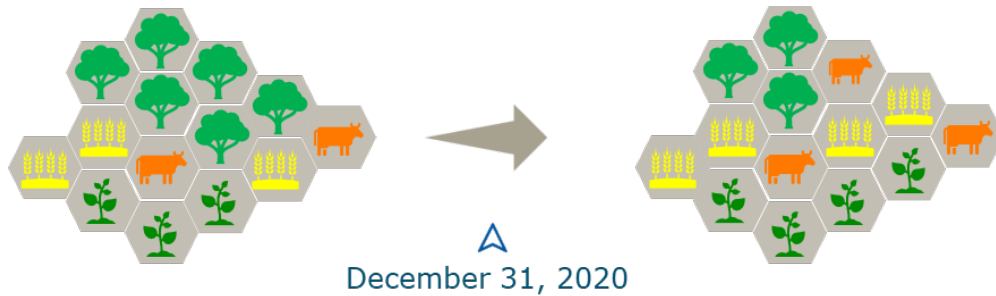
### The regulation determines a cut-off date for mandatory due diligence rules to be implemented.

The current text for the EU deforestation regulation states December 31, 2020 as defined by SDG target 15.2 (IISD, 2022), as a cut-off date for commodities and products not adhering to the regulation not being allowed to enter or exit the EU market. In other words, if coffee or coffee products were produced on land subject to deforestation or forest degradation after that date they cannot be exported into the EU (Council of the European Union, 2022). From this date, the due diligence requires operators to have the geographic coordinates (or geolocation via latitude and longitude) of all the plot(s) of land where the relevant commodities and products are produced. Including the name, email and address of any business or person from whom and to whom the relevant commodities or products have been sourced and supplied (Council of the European Union, 2022). Figure 2.1 explains how different cut-off dates define deforestation in a land-use change, and Box 2.1 gives a tentative time for the regulation to come into place.

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<sup>4</sup> A country that is not a member of the European Union as well as a country or territory whose citizens do not enjoy the European Union right to free movement, as defined in Art. 2(5) of the Regulation (EU) 2016/399 (Schengen Borders Code) (European Commission, 2022).



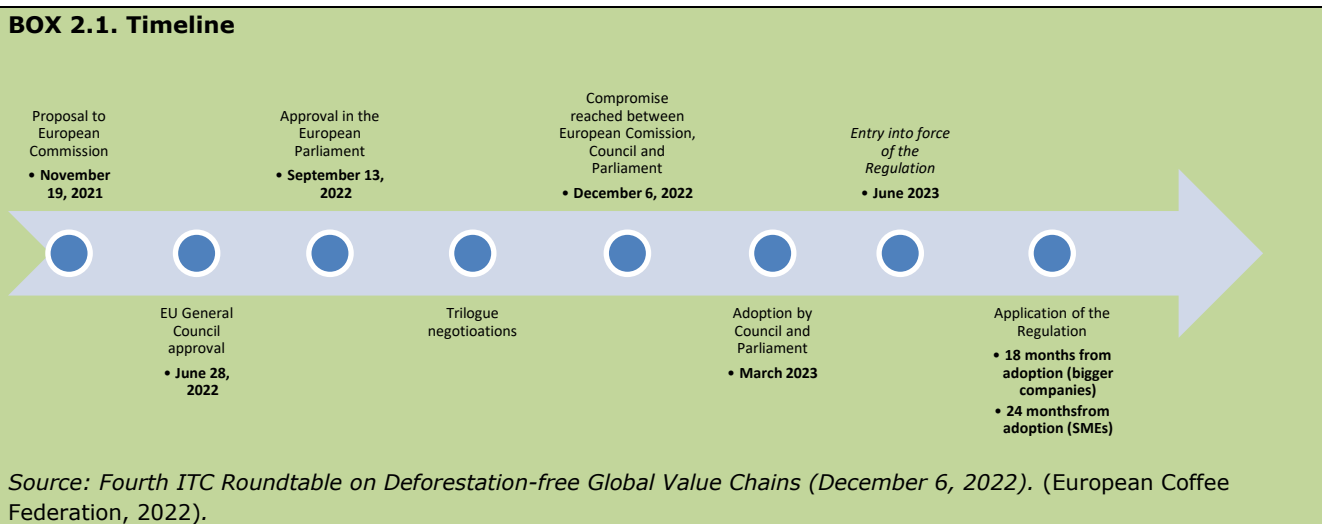


Agricultural land expansion and forest loss occurring **after** the cut-off date, would be considered deforestation

**Figure 2.1** Commodity inclusion into the legislation based on land-use change relative to cut-off date  
 Source: Own elaboration.

The regulation announces the establishment of the EU observatory on deforestation to better monitor changes in forest cover, while taking into account human rights and balance between environmental protection and business interests.

The EU Observatory should facilitate access to information on supply chains for public entities, consumers and businesses, providing easy-to-understand data and information linking deforestation, forest degradation, and changes in the world's forest cover to EU demand/trade for commodities and products. Thus, it must support the implementation of this Regulation by providing scientific evidence regarding global deforestation and forest degradation and related trade and in cooperation with the competent authorities. Furthermore, the Regulation should take into account the protection of human rights and the rights of indigenous peoples and local communities, both in the Union and third countries, while ensuring a proper balance between protecting the legitimate expectations of traders and operators and minimising sudden disruption to supply chains and the fundamental right to protection of the environment. Competent authorities shall cooperate to ensure compliance with this Regulation, including when possible infringements have been detected and the implementation of field audits (Council of the European Union, 2022).



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## 3. How are deforestation and forest degradation defined?

The EU regulation applies specific definitions to forests, deforestation, forest degradation and agricultural plantations, which may differ from (legal) definitions used in the producer's countries.

Article 2 of the EU deforestation regulation gives the definitions that are applied for the purpose of the regulation. The most relevant are the definitions for deforestation, forest, agricultural plantations, forest degradation, naturally generated forest and deforestation free (See Box 3.1). In relation to coffee production, these definitions imply that all coffee plantations, even when grown in an agroforestry system that meets the structural requirements for forest, is considered deforestation when done in land that used to be forest. The only exception could be natural coffee forests in Ethiopia and Southern Sudan. From the definitions in the regulation, it also follows that forest degradation only refers to forests used for wood production. As soon as the forest is used for agricultural production, including coffee agroforestry, this is considered under the deforestation definition. In relation to export to the EU the term 'deforestation free' is used, which introduces a cut-off date of 31 December 2020. Only export to the EU of deforestation-free products is allowed, which means that only coffee from plantations on land that was deforested already before the cut-off date is allowed. Even though this land is still considered deforested, the goods from it are labelled deforestation-free and, therefore, may be put on the EU market.

While the term 'deforestation' is understood as the reduction in forest size, forest degradation is the result of a more gradual process of biomass decline.

While a forest's biomass declines, its species composition changes. Soil quality deteriorates, while land could still meet the definition of a forest. Forest degradation is, therefore, often a precursor to deforestation. Another commonly used term for forest degradation is forest disturbance, to capture the process of human activities in previously 'undisturbed' forest zones (Vancutsem *et al.*, 2021). Implementing satellite images is becoming the standard for monitoring environmental conservation, including forest loss. Satellites permit temporal monitoring of remote regions, otherwise scarcely monitored. Satellites capable of determining forest area by vegetative height can measure a resolution of up to 0,5-hectare (JRC, 2021; Vancutsem *et al.*, 2021). There are also high spatial resolution data (less than 5 m,) moderate spatial resolution (between 5 m and 60 m), and coarse resolution (greater than 60 m); however, there are limited published studies mapping coffee production areas and quantifying the associated land cover and land-use change (Hunt *et al.*, 2020).

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**Box 3.1. Definitions used in the EU deforestation regulation** (Council of the European Union, 2022)

'**deforestation**' means the conversion of forest to agricultural use, whether human-induced or not;

'**forest**' means land spanning more than 0,5 hectares with trees higher than 5 metres and a canopy cover of more than 10%, or trees able to reach those thresholds in situ, excluding land that is predominantly under agricultural or urban land use;

'**agricultural use**' means the use of land for the purpose of agriculture, including for agricultural plantations, and includes livestock and set-aside agricultural areas;

'**agricultural plantations**' means tree stands in agricultural production systems, such as fruit tree plantations, oil palm plantations, olive orchards and agroforestry systems when crops are grown under tree cover. It includes all plantations of the relevant commodities other than wood. Agricultural plantations are excluded from the definition of 'forest'.

'**forest degradation**' means structural changes to forest cover, taking the form of the conversion of primary forests or naturally regenerating forests into plantation forests or into other wooded land and the conversion of primary forests into planted forests;

'**naturally regenerating forest**' means forest predominantly composed of trees established through natural regeneration; it includes forests for which it is not possible to distinguish whether planted or naturally regenerated; it includes forests with a mix of naturally regenerated native tree species and planted or seeded trees, and where the naturally regenerated trees are expected to constitute the major part of the growing stock at stand maturity; it includes coppice from trees originally established through natural regeneration; and it includes naturally regenerated trees of introduced species;

'**deforestation-free**' means; (a) that the relevant products contain, have been fed with or have been made using, commodities that, were produced on land that has not been subject to deforestation after 31 December 2020, and (b) in case of relevant products that contain or have been made using wood, that the wood has been harvested from the forest without inducing forest degradation after 31 December 2020.

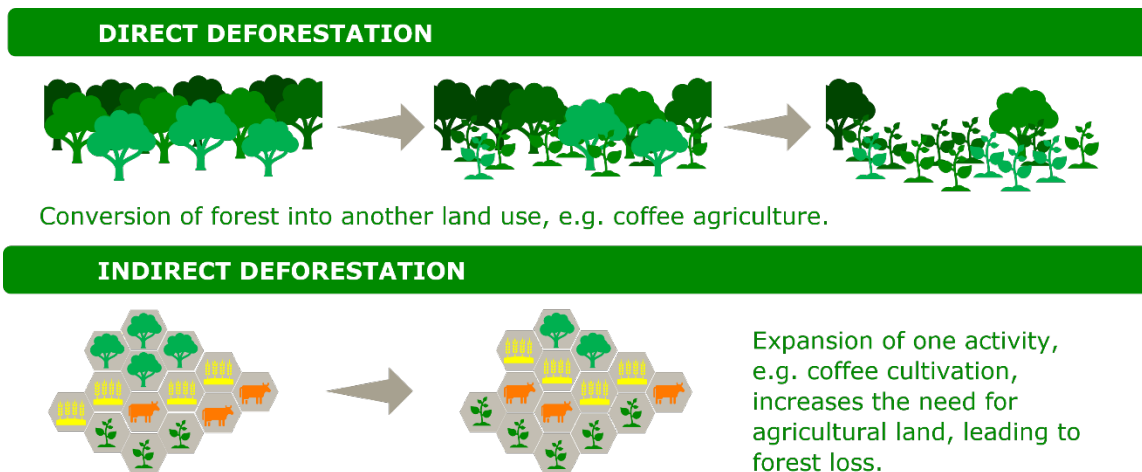
### The 0.5 ha is used for defining a forest, which may be subject to deforestation, but not for determining coffee plantations or other agricultural production systems.

For example, suppose (part of) the forest (meeting the 0.5 ha size limit) has been converted to a coffee plantation before the cut-off date in the regulation. In that case, this is not considered deforestation in the regulation. Suppose (part of) the forest (meeting the 0.5 ha size limit) is converted to a coffee plantation after the cut-off date. In that case, this (part of the) forest is considered deforestation in the regulation, whether or not the land is further divided afterwards. This could also be, for instance, 0.2 ha which is deforested. The 0.5 ha refers to the definition of a forest, not the minimum area considered for deforestation. Finally, suppose (part of) the forest area is first divided over land titles smaller than 0.5 ha before it is converted to a coffee plantation. In that case, this does not matter for the outcome (depending on when the conversion happens compared to the cut-off date). The forest area is based on the size of the continuous forest that can be determined from monitoring, irrespective of the distribution over different owners.

### Coffee production can contribute directly or indirectly to deforestation.

Coffee production contributes directly when forest conversion can be unequivocally linked to coffee agriculture. For example, when planting coffee trees under the shade of a primary forest and gradually replacing forest trees with coffee trees over time. Alternatively, coffee may also function as an indirect driver of forest loss, whereby expansion of coffee farms increases the need for agricultural land, which results in the displacement of other agricultural activities, e.g., animal rearing, prompting the conversion of forest into land used for such activities, as visualised in Figure 3.1. A forest area may be temporarily unstocked as a result of (sustainable) wood harvesting or natural disturbances. However, if the land was originally forest and was converted into non-forest use, it will be considered deforestation, even if in a later stage the area is afforested again. Moreover, if forest lands are converted into coffee farms, conversion is unlikely to be temporary as

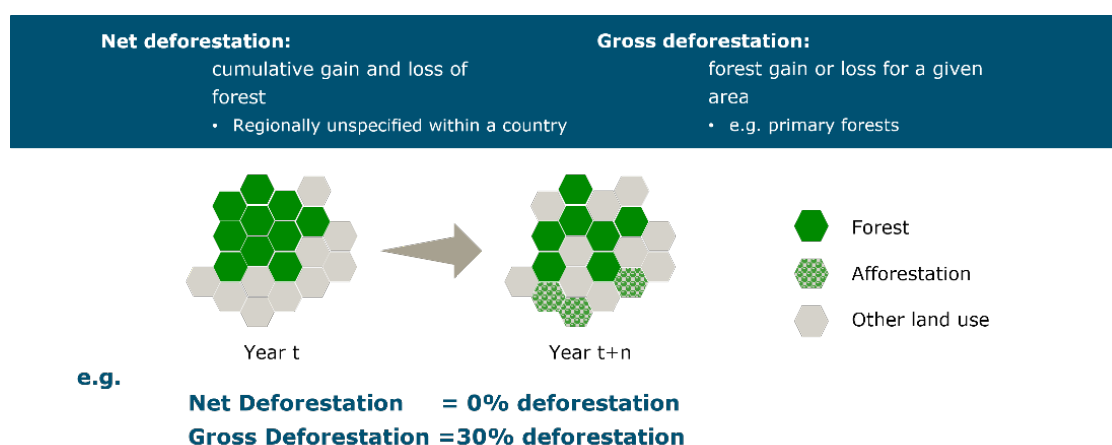
coffee trees are perennials and are rarely replaced before the end of their productive lifespan after 20-30 years. Consequently, coffee farms are likely to remain on the same land and represent a relatively constant form of land use over time once the farm has been established. This intrinsic stability may be challenged in the coming years as climate change renders some coffee-growing regions inhospitable for the crop, possibly driving the displacement of coffee farms away from current regions (Somarriba and Lopez-Sampson, 2018; Sachs *et al.*, 2019; Grüter *et al.*, 2022).



**Figure 3.1** Direct and indirect deforestation through the expansion of coffee cultivation  
Source: Own elaboration.

Differences between net and gross deforestation are also important to consider.

Net deforestation reflects cumulative forest gain and loss, irrespective of the location where these activities occur. This regional indifference, therefore, excludes the historical designation of the land, e.g., as forest or agriculture. Conversely, gross deforestation reflects the chronological land use and its conversion from forest into another form. Figure 3.2 visualises the differences with an abstract example where net deforestation is zero, compared to a 30% gross deforestation.



**Figure 3.2** Net and Gross deforestation  
Source: Own elaboration.

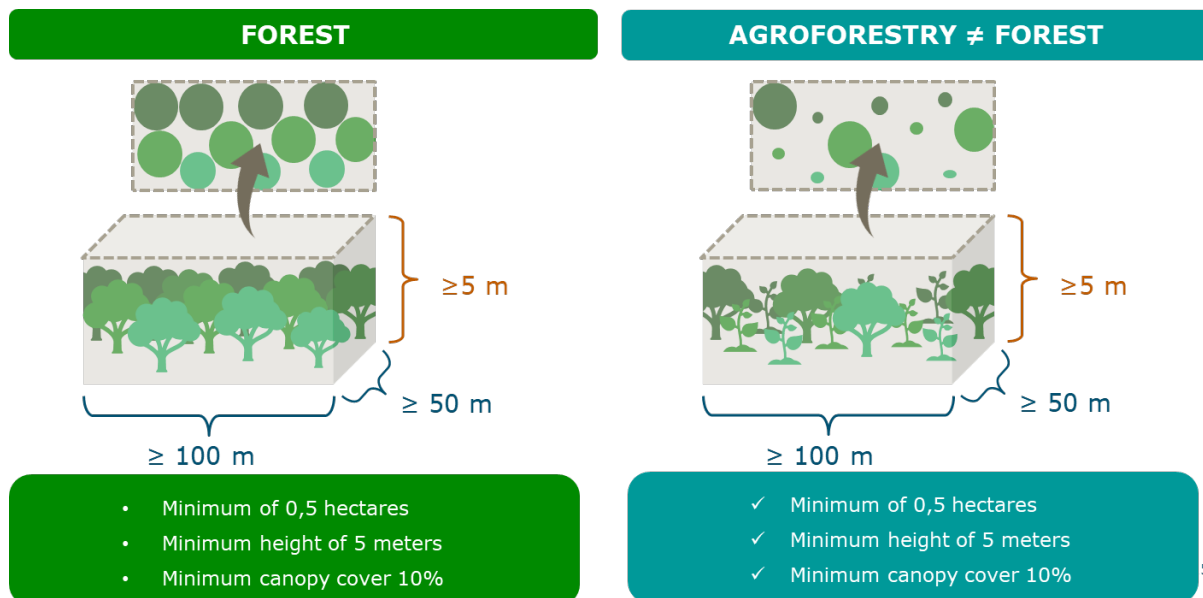
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While conversion from forest to agroforestry is considered as deforestation in the EU deforestation regulation, there is an overlap in the structural characteristics of forest and agroforestry classifications.

According to the definitions in the regulation any conversion from forest to agricultural use, including agroforestry where crops are grown under tree cover, is considered deforestation. Agroforestry, defined by tree cover on agricultural land greater than 10%, is found on more than 43% of all agricultural land globally (Zomer *et al.*, 2014), and a practice actively encouraged within the coffee industry as a sustainable practice to mitigate the effects of climate change (Somarriba and Lopez-Sampson, 2018). Agroforestry systems and intercropping provide smallholder farmers with additional revenue streams to bolster their income as well as encourage local food security. While shade tolerance depends on the coffee variety, the accepted optimum canopy cover in coffee agroforestry systems ranges between 20-50%, with some standards applying a higher threshold of 40% regulation (de Sousa *et al.*, 2016), which are safely above the 10% requirement that must be classified as a forest under the regulation. As implied by their function, shade trees surpass the height of coffee trees, and as a result place the field within the range needed to be classified as a forest under the height and canopy requirements in the regulation. Furthermore, as coffee trees take 3-4 years before bearing fruit, all the coffee on the market from the moment the regulation comes into effect must have been planted before 31 December 2020, the cut-off date within the final regulation.

The overlap in structural characteristics between forest canopy and coffee agroforestry requires attention for the resolution in measurement.

The latest definitions included in the regulation defines 'naturally regenerating forest' and it includes a mix of naturally regenerated native tree species and planted or seeded trees. There is a concern in the coffee community with the application of spatial resolution when analysing coffee plantations. Coffee production systems are complex and difficult to identify with existing remote sensing classification approaches (Hunt *et al.*, 2020). Sixty per cent of global coffee is produced from farms of less than 0.5 hectares (Siles, Cerdán and Staver, 2022). Coffee is grown in complex topographies (Lu *et al.*, 2008; Langford and Bell, 2010), where plantations can often be confused with other crops and land cover (Langford and Bell, 2010; Schmitt-Harsh, 2013). Unshaded coffee can be confused with pastures (Bernardes *et al.*, 2012), and some shaded coffee systems confused with primary and secondary forests (Cordero-Sancho and Sader, 2007; Lu *et al.*, 2008; Langford and Bell, 2010). This may be an issue during checks by competent authorities enforcing the due diligence system if structural canopy changes are observed by remote sensing in agroforestry systems that existed before 31 December 2020 but in which coffee plants are for instance pruned or replaced. In such cases, the inspecting authorities could wrongly conclude that deforestation has taken place after 31 December 2020. In the implementation of enforcement mechanisms for the regulation such specificities of coffee and other agroforestry systems will need to be considered.



**Figure 3.3** Agroforestry systems in the light of the EU Regulation  
 Source: Own elaboration based on (Council of the European Union, 2022).

Reliable estimates of deforestation should go beyond tree cover loss and be randomly verified through field visits (ground truthing).

Critical data challenges remain to track deforestation consistently: data quality remains a significant issue (see Pendrill *et al.*, (2022) for detail review of data challenges). Even with well-known referenced databases like the Global Forest Resources Assessment and Remote Sensing Survey (FAO, 2020a, 2022b) from FAO, such datasets rely on countries' self-reported trade and land-use statistics, whereby these data are known to differ, sometimes substantially, from land-use data based on remote-sensing techniques (Liu *et al.*, 2018). Not every country possesses official national-level statistics or even subnational agricultural statistics. In addition, the quality of data collection protocols and reporting may be politicised, leading to structural biases (Martínez, 2022). Similarly, consistent pan-tropical data—needed to assess the difference between areas in dry and wet tropics—is lacking (Pendrill *et al.*, 2022). Therefore, reliable estimates should go beyond tree cover loss and should be randomly verified through ground truthing. These challenges highlight the importance of investing in estimates consistently across regions and over time.

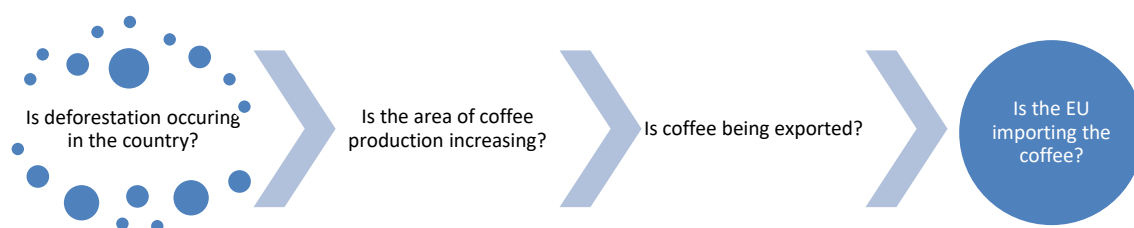
**Box 3.1: Timber Income from Agroforestry**

Falsely attributing legal canopy thinning or loss in these regions to deforestation, potentially adversely affects trading from these regions, sustainable development as well as smallholder income. Deforestation by legal and illegal logging (based on country specific regulations) of primary forests may persist, driven by the demand for quality timber. Improving the quality of timber originating from sustainable agroforestry systems have the potential not only to reduce the demand incentivising deforestation of primary forests, but also to increase smallholder income. De Sousa and colleagues (2014) found that timber from agroforestry systems contributes to smallholder income accounting for “11–49 % of the [Net Present Value] [...] depending on the type of system, species and discount rate” (de Sousa *et al.*, 2014). De Sousa and colleagues (2014) put forward that timber quality can be significantly improved within agroforestry systems through sustainable practices, potentially satisfying the quality requirements driving the demand behind illegal logging. Coffee agroforestry systems were found to have amongst the highest potential (de Sousa *et al.*, 2014).

## 4. Why was coffee included in the EU regulation?

Coffee is incorporated into the current regulation due to the term 'embodied deforestation,' which means there is an association between production in coffee production areas and deforestation.

The dataset used for the initial inclusion of coffee into the EU regulation employs data representative of net deforestation from an FAO database (FAO, 2020a, 2022a) in the form of a percentage of forest area. While there are several drawbacks to utilising data representative of net deforestation, the FAO database contains global data collected on annual basis with a standard protocol, providing temporal resolution, spanning back several decades, before satellite imaging emerged. It is essential to mention that deforestation was embedded into the supply chains relative to the increase in land use (Pendrill, Persson, Godar, Kastner, *et al.*, 2019). In other words, if coffee was responsible for 5% land expansion, then 5% of the national deforestation would be attributed to the commodity. Moreover, as an important importer of coffee, the EU is responsible for 30-40% of the embodied deforestation for coffee, which is a larger percentage than for any of the other commodity included in the regulation.<sup>5</sup> Embodied deforestation was determined for the EU regulation from accessible data from international sources, including the FAO database. The prerequisite for embodied deforestation is that forest loss is occurring. The FAO database contains the percentage of each country classified as forest. Without regional specificity, these values represent the net forest content of the country. Data on land use for coffee production has been systematically collected by FAO, allowing one to plot production areas over time to determine whether land use for coffee agriculture has been expanding or receding within a given country. Where forest land is receding and land used for coffee cultivation is growing, coffee agriculture is considered to contribute to deforestation in these countries (Figure 4.2 shows our own calculations based on (Pendrill, Persson, Godar, Kastner, *et al.*, 2019) supplementary material). Finally, for the EU regulation to apply, it matters whether or not the coffee is exported to the EU.



**Figure 4.1** Steps to calculate embodied deforestation

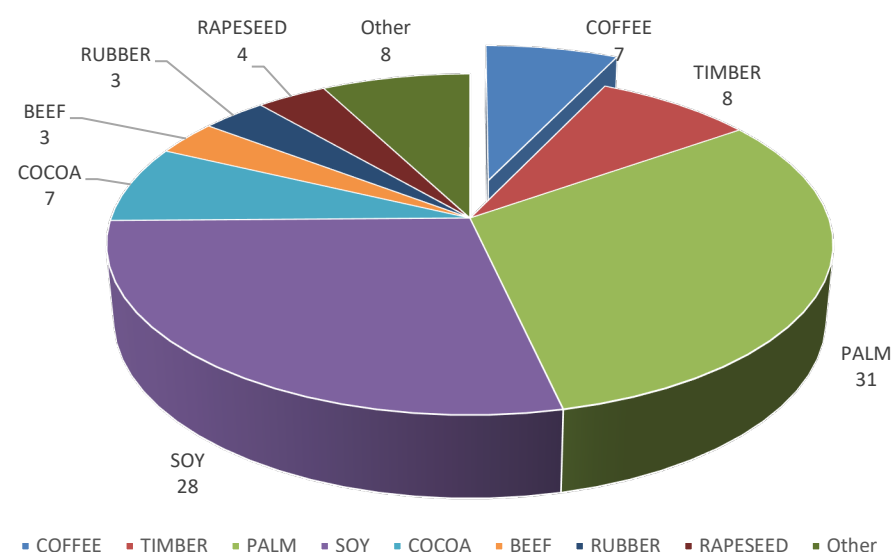
Source: Own elaboration based on (Pendrill, Persson, Godar, Kastner, *et al.*, 2019).

<sup>5</sup> Analyses based on data from Pendrill (2019) on page 57 in Bougas *et al.* (2021). Service contract on EU policy on forest products and deforestation: Task 3 - Impact assessment on demand side measures to address deforestation. Report for DG Environment, European Commission, Brussels, Belgium. <https://ec.europa.eu/environment/forests/pdf/IA%20Deforestation%20-%20Final%20report.pdf>



## The coffee community has challenged the 7% embodied deforestation for coffee included in the EU regulation.

Although the EU regulation refers to the data set from Pendrill, Persson and Kastner (2020) for its embodied deforestation data source,<sup>6</sup> Pendrill, Persson and Kastner (2020) did not perform the calculation to derive the value of 7%. They limited the scope of their study to selected commodities,<sup>7</sup> including green coffee beans (HS 090111), which is one of the coffee commodities affected by EU regulation. However, green coffee is not the only commodity as the regulation will apply to all harmonised system (HS) tariff codes HS 0901 commodities (e.g., green decaffeinated, roasted coffee, roasted decaffeinated). Furthermore, the study focuses on supply chains originating in the Global South, which is mentioned in several of the proposed EU regulation impact assessments, as well as clarified in the supplementary material of (Pendrill, Persson, Godar, Kastner, *et al.*, 2019). This information suggests that the EU's demand for green coffee beans may be linked to deforestation in coffee-producing countries, which confirms the relevance of coffee to be included in the scope of the regulation.



**Figure 4.2** Embodied deforestation quantified as the average contribution of each considered commodity as a share (%) of the total contribution of EU consumption in terms of risk of embodied deforestation, between 2008 and 2017

Source: WUR computation based on (Pendrill, Persson and Kastner, 2020)

<sup>6</sup> Footnote 32, page 26 of the REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL Brussels, 21.12.2022. 'Pendrill F., Persson, U.M., Kastner, T. 2020'

<sup>7</sup> Cattle meat, soybeans, palm oil and forestry products, cereals, other oilseeds, pulses, roots and tubers, vegetables, fruits, tree nuts, fibre crops and other crops (coffee is included in the 'other' category)

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## 5. What is the potential risk of deforestation and forest degradation in coffee-producing countries?

Guidelines on the country benchmarking system and due diligence rules have not been released, and there is a lot of uncertainty about how to proceed.

The EU regulation proposes a benchmarking system to assign producer countries or part of countries a level of risk related to deforestation (low, standard or high) to set mandatory due diligence rules (European Council, 2022). The Regulation will establish the EU Observatory on deforestation to monitor changes in forest cover. Currently, there are several tools and resources available to begin to understand the risks associated with commodities production (Global Forest Watch, 2022; West *et al.*, 2022) and also more specifically for coffee production (Hunt *et al.*, 2020; Conservation International, 2022). To provide the coffee sector with a tool to localise the potential risks and identify areas where coffee production countries should focus efforts on minimising deforestation and forest degradation, we analyse the deforestation, biodiversity and agricultural water risk scores developed via commodity mapping used by The Sustainability Consortium (TSC). This method prioritises which regions pose a potential risk of deforestation and biodiversity loss which can be used to implement actions to prevent deforestation, biodiversity loss, and water risk (see Box 5.1 with methodology and definitions).

### **BOX 5.1 Methodology for Commodity mapping and definitions**

The commodity mapping methodology evaluates the available scientific knowledge to identify potential risks of deforestation, biodiversity loss and water risk. It shows which regions pose a potential threat by overlapping geospatial maps of agricultural production source regions (IFPRI, 2010) with the areas where the risk of deforestation, biodiversity loss, and water risk is identified (Curtis *et al.*, 2018, Hoffman *et al.*, 2016, Rutger Willem Hofste *et al.*, 2019).

Specifically, only risk map pixel values that overlap with the pixel values representing production in metric tons are compiled in a new map as the risk production. A ratio is calculated by dividing this risk production value in a given region by the total production values. This ratio represents the risk score for the given commodity, where 0 is least likely, and 1 is most likely.

**Commodity-driven deforestation (CDD):** occurs in an area where long-term, permanent forest conversion to agriculture, mining, or energy infrastructure was detected (Curtis *et al.*, 2018).

**Shifting agriculture (SA):** occurs in an area where small- to medium-scale forest conversion to agriculture occurs, that is later abandoned and subsequent forest regrowth was detected (Curtis *et al.*, 2018).

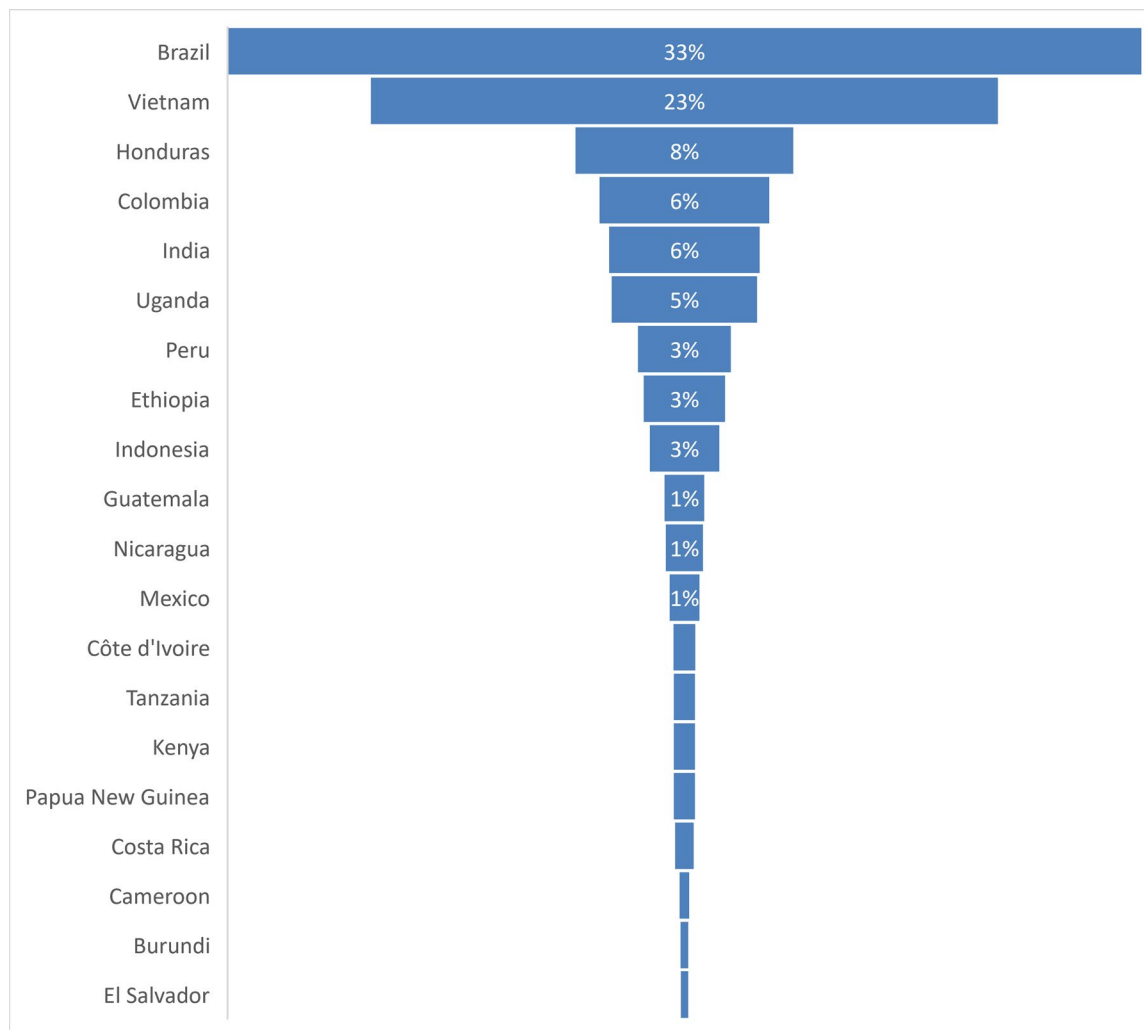
**Biodiversity risk:** occurring in areas that are biodiversity hotspots (Hoffman *et al.*, 2016).

**Agricultural water risk:** occurring in an area that contains a water-related risk in the categories based on quantity (physical), quality (physical), or regulatory and reputational (e.g. no drinking water or no sanitation) (Rutger Willem Hofste *et al.*, 2019).

The potential risk scores presented aim to guide countries in setting the agenda for action and support due diligence processes for coffee production where relevant.

There are more than 80 countries producing coffee beans and more than half of the world's coffee harvest is concentrated in Brazil, Vietnam, and Indonesia (Treanor and Saunders, 2021). We evaluate the risk of deforestation and forest degradation for the top 40 producing countries and sub-country regions and focus on those countries where most of the coffee is exported into the EU and based on ICO statistics. Most of the coffee imported into the EU coffee originates from Brazil and Vietnam (60-kg bags of GBE) (Box 5.2). We evaluate the overall potential environmental risks measure that include deforestation, biodiversity and water risks, together with the more detailed deforestation risks for CDD and SA. Details on country and sub-country level data are made available to ICO and CPPTF for planning and to support high-risk countries.

**Box 5.2 Most coffee imported in the EU coffee originates from Brazil and Vietnam**

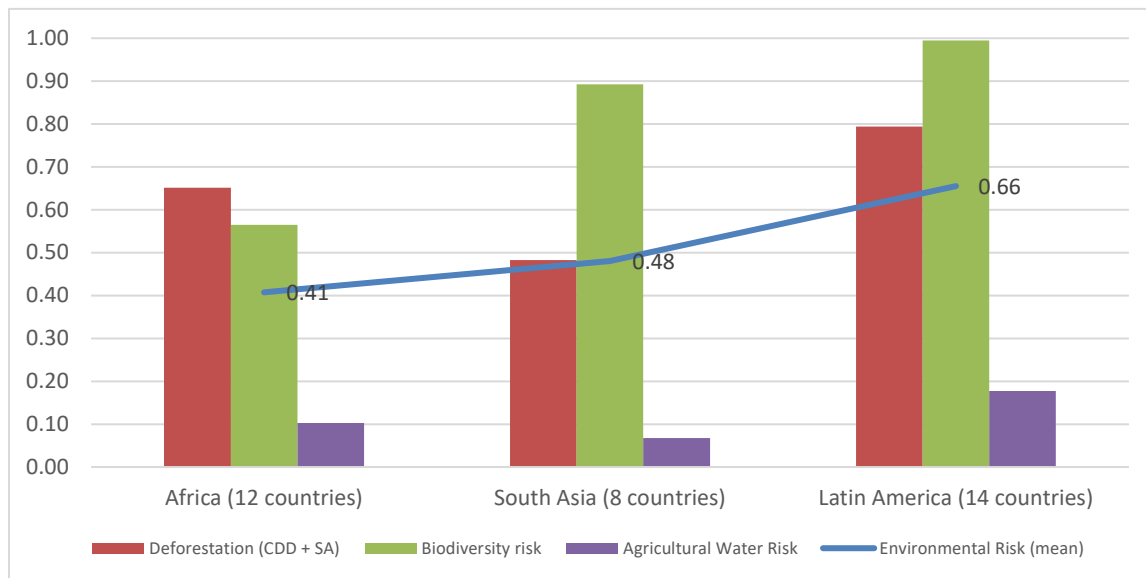


Note: calculated as the average green coffee exports (60-kg bags of GBE) to the EU per country between 2016-2020.

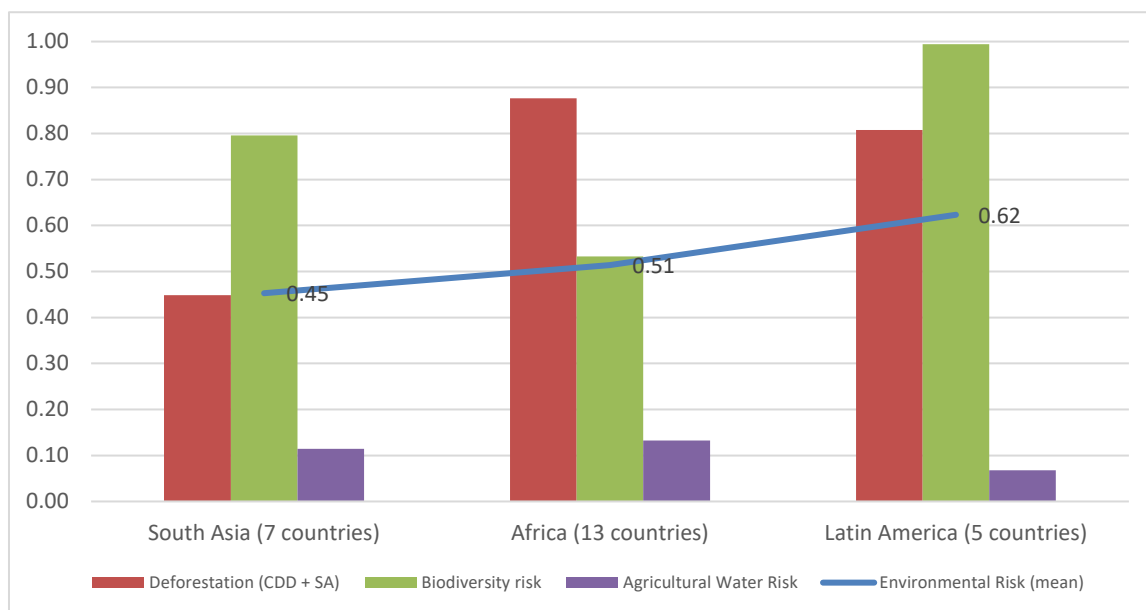
Source: Own computation based on ICO country statistic.

A risk score calculation provides a composite measure of environmental degradation, including, deforestation, biodiversity loss and water agricultural water risk.

Countries in Figures 5.1 and 5.2 are ordered from low to high potential environmental degradation due to Arabica or Robusta production, whereby a score of 0 signals the lowest risk of environmental degradation and 1 the highest. Countries display a higher potential risk of environmental degradation in Latin America than in other regions, being above 0.60, on average, for both Robusta and Arabica. Differences between Robusta and Arabica are more evident in Africa and South Asia. The calculated environmental risk is higher in areas where Robusta is produced (0.51) in Africa compared to Arabica production areas (0.41). The opposite holds for South Asia. The overall environmental risk is higher in Arabica production regions (0.48) as compared to Robusta (0.45).



**Figure 5.1** Potential environmental, deforestation, biodiversity and agricultural water risk for *Arabica* production in Africa, South Asia and Latin America  
 Note: Bars represent the average for each region risk scores were 0 is least likely and 1 most likely.  
 Source: own elaboration based on commodity mapping of The Sustainability Consortium (TSC).



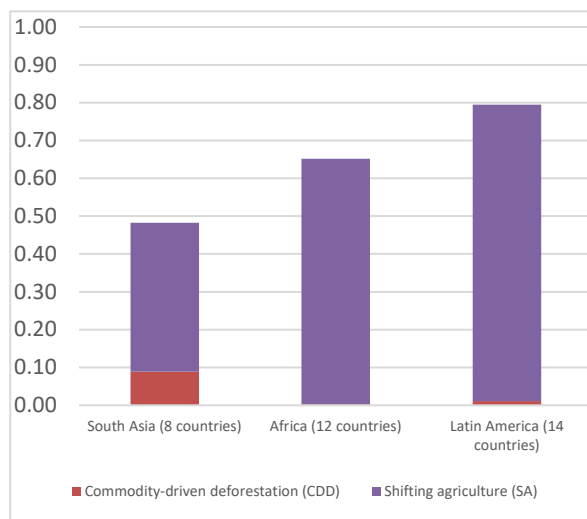
**Figure 5.2** Potential environmental, deforestation, biodiversity and agricultural water risk for *Robusta* production in South Asia, Africa and Latin America  
 Note: Bars represent the sum of CDD and SA risk scores were 0 is least likely and 1 most likely.  
 Source: Own elaboration based on commodity mapping of The Sustainability Consortium (TSC).

The information presented does not imply that deforestation currently occurs in the country but that there is a potential risk based on historical evidence.

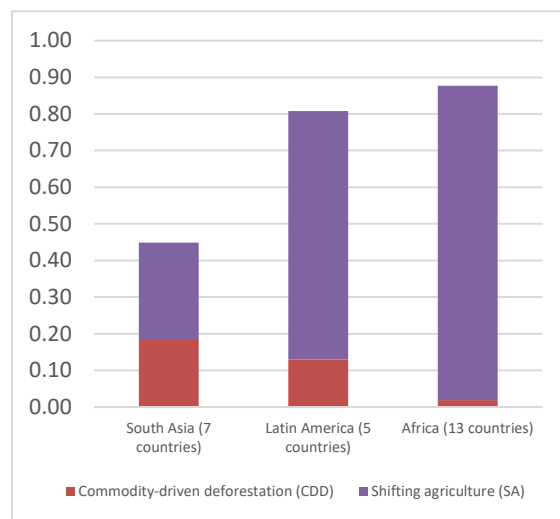
The model applied to assess the risk uses data representing tree cover loss from 2001 through 2019, specifically for CDD and SA. This means that from 2001 to 2019 if the model detected a loss, it would be calculated and represented as either CDD or SA. In the same way, by definition, biodiversity hot spots are also more prone to loss of biodiversity risks than areas which do not have biodiversity hotspots. For example, countries with larger forest coverage are more at risk (Curtis *et al.*, 2018).

### CCD deforestation and SA capture two distinct processes driving deforestation and forest degradation.

We analyse the two definitions representing agriculture in the TSC commodity mapping: CCD and SA in the context of coffee. Studies have implied that large-scale commodity production is inherent in the definition of commodity-driven deforestation (Harris *et al.*, 2020). However, it is not clear from Curtis *et al.*, (2018) if small-scale agriculture is also included in CCD. SA represents small to medium forest conversion to agriculture that regrows after a period of time (without a specification of the length of the period). Due to the temporary nature of the definition of shifting agriculture, it seems unusual in the context of coffee plantations where coffee trees can be productive for about 15 years (Nigam and Singh, 2014). Nonetheless, shifting agriculture could occur from smallholder livelihood activities prompting deforestation in coffee-producing areas even though not for coffee production itself (Meyfroidt, Vu and Hoang, 2013).



**Figure 5.3** Potential risk of deforestation for *Arabica* production in South Asia, Africa and Latin America  
Note: Bars represent the average for each region risk scores were 0 is least likely and 1 most likely.  
Source: own elaboration based on commodity mapping of The Sustainability Consortium (TSC).

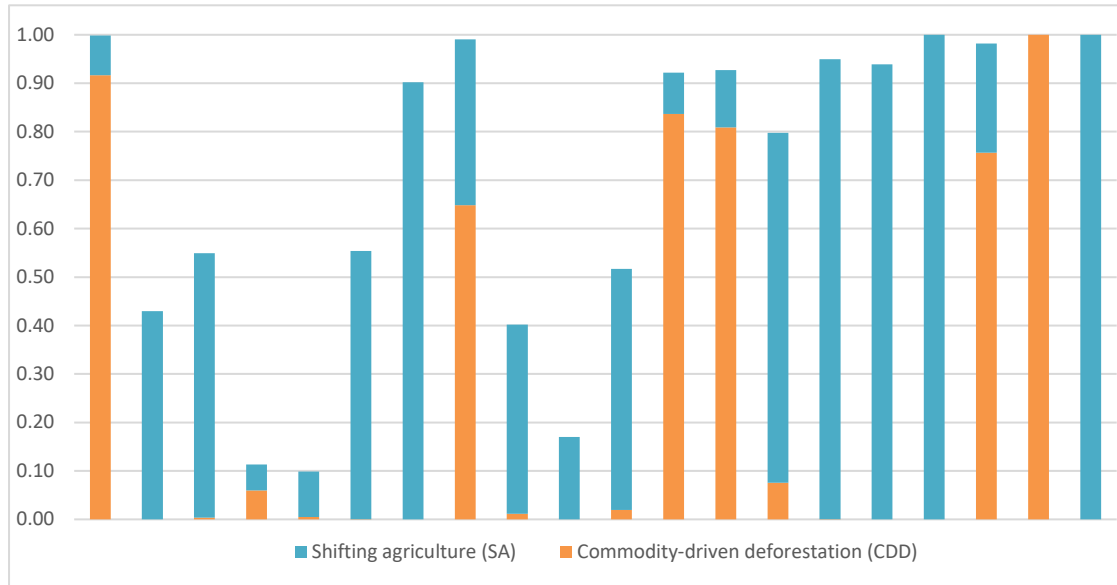


**Figure 5.4** Potential risk of deforestation for *Robusta* production in South Asia, Latin America and Africa  
Note: Bars represent the average for each region risk scores were 0 is least likely and 1 most likely.  
Source: own elaboration based on commodity mapping of The Sustainability Consortium (TSC).

The potential risk of deforestation is mostly driven by shifting agriculture and there is high variability when looking at coffee-producing regions within a country.

Figures 5.3 and 5.4 show the potential risk of deforestation. There are differences between coffee regions and Arabica and robusta production. For example, the share of CCD for countries in which Arabica is produced in Asia is larger, while in Latin America most countries have a high risk of SA. In Africa, risk is higher for Robusta-producing countries compared to Arabica. Also, there are some

differences in CCD between Arabica and robusta production, but higher potential risk on Robusta-producing countries. Regarding variation within a country, Figure 5.5 shows an anonymous example of Arabica production within a country. The potential risk of CCD is larger and more predominant in some regions than in others. Nonetheless, shifting agriculture is still the main potential risk of deforestation in coffee production in most regions, with the limitations of the definitions above. The Regulation states that operators should be allowed to apply simplified due diligence for relevant products from countries or parts of countries identified as low-risk. As for applicable products from high-risk countries or parts of countries, competent authorities should be required to use enhanced scrutiny (Council of the European Union, 2022). We observed that differences within sub-country regions could be large for some countries. On the one hand, differences within the country can help to focus efforts on high-risk areas. On the other hand, it adds a layer of complexity which complicates the due diligence implementation.



**Figure 5.5** Potential deforestation risk for Arabica production in an anonymous sub-country region as an example

Note: Bars represent the sum of CDD and SA risk scores were 0 is least likely and 1 most likely for each sub-country region.

Source: Own elaboration based on commodity mapping of The Sustainability Consortium (TSC).

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## 6. What are the potential implications for smallholder farmers?

Many uncertainties remain on the implications for smallholders, given the lack of a production-side impact assessment.

Smallholders are the most vulnerable stakeholders in the coffee value chain (Fairtrade Foundation, 2022). The EU regulation aims to introduce additional requirements and scrutiny to their practices, potentially increasing their responsibilities as well as their administrative and financial burden (Blot and Hiller, 2022). Meanwhile, additional import regulations, and the associated costs, are expected to incentivise traders to source from fewer smallholders (e.g. Otsuka, Nakano and Takahashi, (2016)) or move sourcing to lower risk areas. Whether the regulation induces prices to rise sufficiently for the benefit of smallholder farmers, remains uncertain, particularly in monopsonic markets with many smallholders selling to a single buyer (Zhunusova *et al.*, 2022). The latest text of the regulation more strongly stipulates the need to support and engage indigenous and local communities. Nonetheless, it is unclear how to deal with countries having different legal definitions of deforestation and national sovereignty, with changes in new requirements having variable environmental and social impacts, including on ethnic minorities (Meyfroidt, Vu and Hoang, 2013). The demand-side impact assessment did not assess the expected impacts on deforestation on the ground, nor the potential direct or indirect impacts of the regulation on smallholder incomes, human rights violations and land tenure security, which are drivers of deforestation. This would have required consultation with supply chain actors such as companies, investors, traders and coffee farmers and their organisations.

Effective forest and biodiversity protection needs to consider concurrent drivers of deforestation simultaneously.

Effective forest and biodiversity protection implies a vital role for the engagement of smallholder coffee producers, and local governments, sharing information and data, capacity building and concerted action between public and private stakeholders from different sectors. The latter to prevent any shifting of the problem to some other sector or place (Waarts *et al.*, 2019). A range of civil society organisations supports this. Without public support, smallholders may struggle to comply and be excluded from the EU market while deforestation continues (Solidaridad Network, 2022). Furthermore, the regulation may undermine prior international agreements towards achieving SDGs and may reduce coherence with concurrent EU development policies on poverty reduction (European Commission, 2020). It could also disrupt previous collaborative processes towards inclusive development of the coffee supply chains. The example in Box 6.1 demonstrates that a holistic or integrated approach is needed to tackle deforestation related to coffee supply chains. Hence, there is a need to conduct country assessments on the readiness to fulfil the new due diligence requirements, and specially on how smallholder coffee farming families would be affected (EESC, 2022).



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**Box 6.1 Indirect deforestation that can be potentially induced by the EU regulation**

In Vietnam (Meyfroidt, Vu and Hoang, 2013), an expansion of coffee production in agricultural lands led some farmers, mostly ethnic minorities and poor farmers, to sell their land. Many subsequently relocated to forest zones, clearing and cultivating such lands to make a living. This case highlights a mechanism that is of risk being replicated by the regulation at a greater scale. The regulation is likely to push up the price of 'clean land' (as Zhunusova *et al.*, (2022) call it), i.e., land that had been deforested before the cut-off date. It makes production for EU markets on such lands more remunerative, displacing production for domestic and non-EU markets. In some instances, major trading houses or producers may opt to purchase such lands from smallholders outright. They, in turn, are likely to continue encroaching forest zones resulting in indirect deforestation and expansion of agricultural land (Meyfroidt, Vu and Hoang, 2013; Kissinger, 2020).

### The regulation might create a market barrier that must be overcome to gain access to the EU marketplace, leading to a market distortion.

Complying with the due diligence requirements might favour larger commercial farms over smallholders in supply chains (Macchi, 2022). As the compliance costs for the same quantity of green coffee will be greater when sourced from many smallholders with complex value chains than when sourced from one large producer (i.e., a container of coffee can originate from one commercial farm or several thousand smallholders). Moreover, there might be potential shifts in EU trade towards 'low risk' producer countries from 'high risk' producer countries, as highlighted in the impact assessment on demand-side measures to address deforestation (European Commission, 2021). Such a shift poses a threat to policy coherence, where the scope for poverty reduction is likely to be greater in high-risk countries.

### EU legislation may push production of raw materials for domestic consumption, or coffee destined to some non-EU markets into forest zones.

While studies on the embodiment of deforestation into commodity supply chains acknowledge the conversion of forest into agricultural land, these studies do not address whether foreign demand is the cause of agricultural land expansion. It is not certain that coffee expansion is necessarily the prime (or only) causal driver of deforestation. Rather, deforestation is an outcome of a rural population seeking a (living) income by satisfying a rising demand for food in urban markets, as a function of strong population growth in developing countries (e.g. (UNDP, PBL, Joint Research Centre of the European Commission (JRC), 2021). This is an important point as it is assumed that the EU regulation will decrease the conversion of forest to agricultural land. If deforestation is driven by confounding factors, such as population growth, resource deficiency, or financial strain within the population, then the impact of restricting trade on the grounds of deforestation from these regions is expected to have only limited impact on reducing deforestation, if any. In fact, the introduction of the regulation can exacerbate undesired actions, by more strongly pushing agriculture for domestic food demand, or coffee production destined for non-EU markets, into forest zones (see Box 6.1).

### A mix of public and private actions is needed to increase the effectiveness of supply-chain initiatives that aim to reduce deforestation.

Effective means of addressing the causes of deforestation are multiple simultaneous interventions (Waarts *et al.*, 2019). Evidence suggests a combination of strong enforcement of forest protection laws; capacity building and support for forest management; payments for ecosystem services (PES) that increase the economic value of forests to local people; and timely national action (Busch and Ferretti-Gallon, 2017; Waarts *et al.*, 2019). Guidelines and due diligence procedures are under development (OECD-FAO, 2022). Guidelines are targeting business and private companies as they have an important role to play in the supply chains. Any efforts designed to stem deforestation will need to ensure that companies can reliably trace and document their

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supply chain (Treanor and Saunders, 2021). However, deforestation policies implemented by companies alone are insufficient to achieve impact on their own due to leakage, lack of transparency and traceability and smallholder marginalisation (Lambin *et al.*, 2018). There is concern about how the information will be managed and if this is an exclusive role of the private sector. Non-commercially sensitive information can be accessible when properly anonymised. Lessons can be learned from countries that have compiled national census data, allowing to demonstrate the continuity of land use throughout the relevant period (Café de Costa Rica, 2022).<sup>8</sup>

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<sup>8</sup> The STATEMENT is based on Costa Rica's national law number 2762 (Civil Code of Costa Rica Law 2762 – On the Regime Relations Producers, Beneficiaries and Exporters Coffee). A unique law in the world that focuses specifically on fair relationships in coffee and creates a layer of traceability of Costa Rica's countrywide coffee production (Café de Costa Rica, 2022)

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## 7. Conclusions and recommendations for the coffee sector

There is a strong need to conduct country level assessments on the readiness to fulfil the new due diligence requirements, and specially on how smallholder coffee farming families would be affected.

Echoing the recommendation of the European Economic and Social Committee (EESC), there is a need to conduct country assessments on the readiness to fulfil the new due diligence requirements, and specially on how smallholder coffee farming families would be affected. Such assessments should guide supporting efforts and enforcement of the requirement to ensuring the efficacy of the EU regulation in delivering on its aim to reduce the import of products that have contributed to deforestation in producing countries. To effectively protect forests and biodiversity and to prevent further marginalisation of smallholder coffee producers, efforts should focus on addressing concurrent drivers of deforestation simultaneously. This should prevent a shifting of the problem to other sectors or places because of the implementation of the regulation, and requires understanding of the root causes of poverty, transparency on data, and action between public and private stakeholders. Further research is needed to understand the links between living income and deforestation.

To be prepared, producing countries, coffee farmers (particularly smallholder farmers) and their producer organisations need timely information and capacity building support on compliance with the regulation.

Country assessments and action plans for traceability systems and compliance must be developed, and for that, implementation guidelines developed by the EU are needed. Guidelines should be tailor made to the characteristics of each sector including value chain characteristics. Within the coffee sector, value chains vary from country to country. Timely preparation, by assessing the responsibilities of enforcing and monitoring infringements on due diligence in producing countries, is necessary. Risk mitigation require field audits where necessary in cooperation with the administrative authorities in third countries. To achieve this, some countries will require support in the transition of the sector, for instance through partnerships with importing countries. Providing funding to enable smallholder farmers to implement measures to adhere to the requirements and to facilitate multi-stakeholder cooperation to address the challenges is key. The EU Regulation is highlighting the need to complement the new requirements with partnerships and collaboration with competent authorities. For example, ICO's Certificate of Origin can provide tools to promote a global forum and facilitating collaboration between operators, traders (ICO, 2021).

Data requirements on geo-localisation and traceability need to feed a discussion on how data should be managed and by whom.

Guidelines and due diligence procedures are under development. Guidelines are targeting business and private companies as they have an important role to play in the supply chains. Any efforts designed to stem deforestation will need to ensure that companies can reliably trace and document their supply chain. Nonetheless, there is concern about transparency, how the information will be managed, how processes will work and whether this is an exclusive role of the private sector (as aimed by the Regulation). Complexities and readiness in the supply chains vary a lot from country to country. Local involvement is highly recommended (farmer associations, local governments, country level institutions) to empower producers to ensure transparency, social inclusion and to make sure that the burden of compliance does not end up with the most vulnerable people. Finally, clarity is needed on how the Regulation and the EU Observatory aims to

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ensure a proper balance between protecting the legitimate expectations of traders and operators and minimising sudden disruption to supply chains and the fundamental right to protection of the environment.

**Sector specific guidelines are required: for the coffee sector it is important to differentiate between forest and coffee agroforestry systems.**

Inherent to the land use definition of deforestation is the capacity to differentiate between forest and non-forest land use (Visualised in Figure 3.3). While it is expressly stated in the regulation that agroforestry systems are not considered forests, assessments using the current parameters could make a differentiation between forest and coffee agroforestry systems difficult or impossible. Furthermore, how to distinguish a naturally regenerating forest that regenerates into a near-natural state, from those that turn into a managed coffee plantation? The latter may not qualify for EU export, even with substantial carbon and biodiversity gains and disregards producing countries' achievements in forest management and afforestation. Special care would be needed in the assessment of agroforestry systems that were in place before the cut-off date of 31 December 2020, as farmers may be legally permitted to harvest shade trees for additional income based on laws and regulations of the producing country. This may temporarily reduce height and canopy cover in the region, appearing as forest loss under current assessment criteria. If timber harvesting in coffee agroforestry systems is classified as deforestation, this may detrimentally affect trade from the region in which it occurs. The same holds if coffee farms are restored by removing or stumping old coffee trees and planting new coffee trees. Alternatively, the EU Observatory may consider verification through other means than satellite imagery. Estimates of deforestation should in any case be randomly verified through ground truthing during field visits.

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