

What can the EU Forest and Rights Observatory learn from Brazil?

A summary of "A Deforestation and Rights Observatory": a case study from Brazil
by Peter May and Saskia Ozinga



The European Union (EU) has stated that it will create a Forest Observatory, focussing on deforestation, forest degradation, changes in the world's forest cover, and associated drivers.¹ This Forest Observatory will play a role in the enforcement of the published but yet to be adopted EU Regulation on deforestation-free products.²

Among tropical forested nations, Brazil has the most comprehensive system in place to monitor deforestation and several promising initiatives that allow the public and private sector to scrutinise beef and soybean production and supply chains to see if they are leading to deforestation in the Amazon and the Cerrado. Brazil does not yet have a system that links the production of commodities and the trade in these commodities to human rights violations, including customary tenure rights or forced labour.

This summary report – the full report is available at www.fern.org/deforestationandrightsob-servatory – shows which Brazilian data could and should be used by the EU Forest Observatory. It also includes recommendations for the EU Forest Observatory and the final EU Regulation on deforestation-free products.

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1 - <https://ec.europa.eu/environment/forests/deforestation.htm>

2 - Regulation 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. Available at https://ec.europa.eu/environment/publications/proposal-regulation-deforestation-free-products_en

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The problem: deforestation and human rights violations driven by agricultural expansion in Brazil

Deforestation

Deforestation arising from the production of commodities for export has been a perennial feature of the Brazilian economy. Initially the main drivers were sugarcane and coffee, but they are now beef and soybeans (for animal feed). This production, fuelled by international demand, has opened up the interior of Brazil, including most recently the Amazon and the Cerrado.

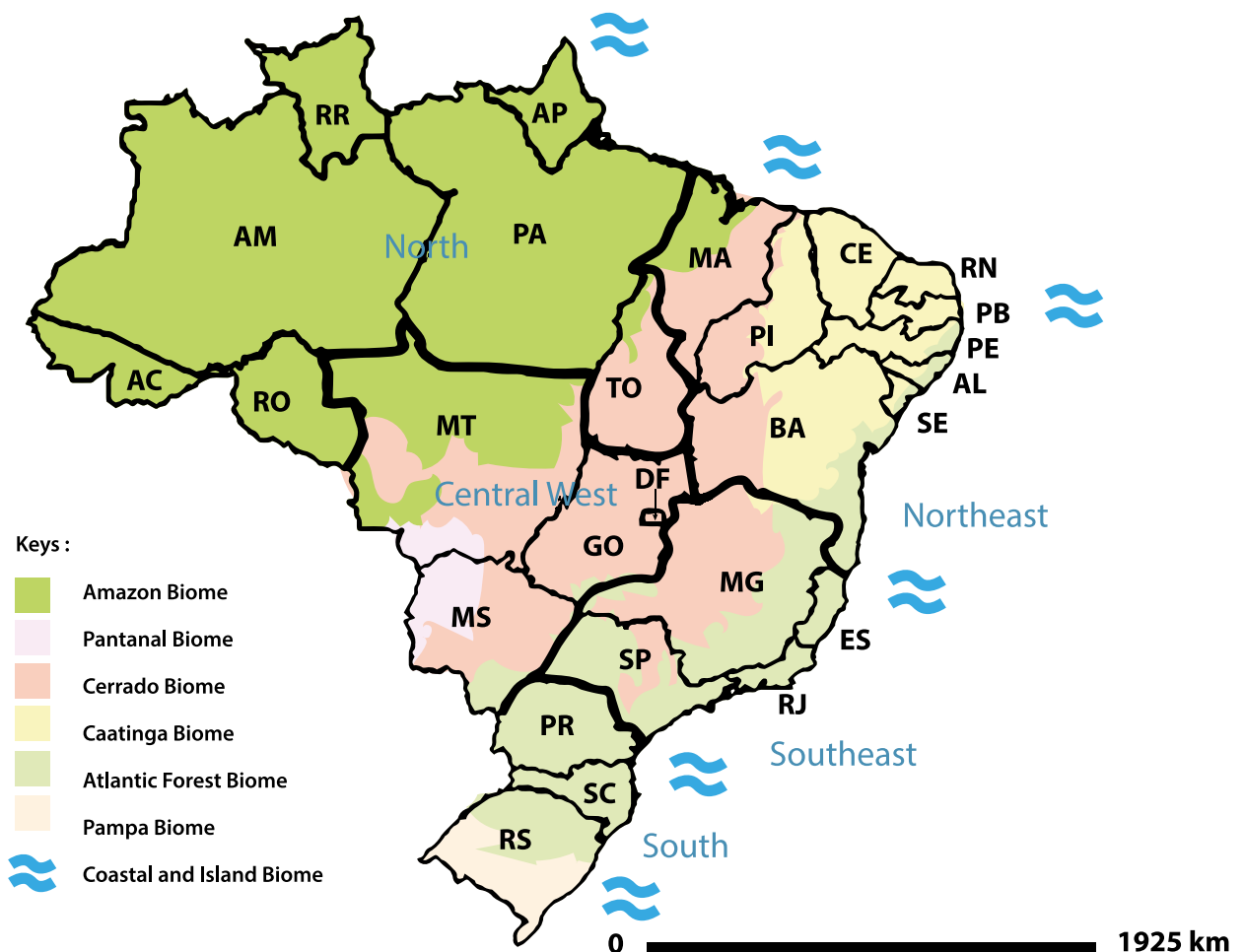


Figure 1. Biomes, Macroregions and States of Brazil. The Legal Amazon states are: Acre-AC, Amapá-AP, Amazonas-AM, Maranhão-MA, Mato Grosso-MT, Pará-PA, Roraima-RR and Tocantins-TO. Some overlap occurs in states in the Cerrado with part of those in the Legal Amazon (MT, MA and TO).

Primarily driven by pasture expansion 20 per cent of the native vegetation of the Amazon and 50 per cent of the Cerrado biome has already been degraded.³ The second largest driver is soybean cultivation that began in the temperate South of Brazil, and gradually shifted to the west and northward.

The Cerrado's transformation into cropland has become pronounced since the 1980s. Within the Cerrado, the Matopiba region has been at the forefront of agricultural expansion, with the soybean area increasing by 253 per cent between 2000 and 2014.⁴

Land tenure conflicts

Agricultural occupations often overlap with Indigenous or Tribal Peoples' customary land, and therefore go hand-in-hand with human rights violations.⁵ Although the Brazilian Constitution (1988) recognises the inalienable right of Indigenous Peoples to their land, in practice, a formal multi-stage process of demarcation is required for Indigenous lands to gain full protection. This has often entailed protracted legal battles, during which time the lands fall prey to incursion. Quilombo territories (those founded by Afro-descendent communities), once legitimised by the federal government, are granted property titles on a collective basis. But, similar to Indigenous rights, the rights of Quilombolas are subject to protracted dispute.

Lack of titling opens the door to incursion, often violent, for agriculture, timber extraction and mining. This is specifically the case in the Amazon, where 60 per cent of rural land conflicts and 84 per cent of related murders occur, but more recent expansion of intensive agriculture in the Cerrado has also led to conflict.⁶ As much of the forest land in Brazil is not registered, it is subject to occupation as a means of taking possession, and this leads to further conflicts.

Forced labour and child labour

More than half of the cases of forced labour identified in Brazil between 1995 and 2020 took place in the livestock sector. Most of these cases occur on farms that breed and rear animals rather than on farms that supply animals directly for slaughter. It appears though there is a decline in forced labour overall, and a smaller proportion of such labour found in the livestock sector; 12 per cent of such cases were classified as "cattle breeding" in 2021.⁷

As for soybean crops, slave labour conditions are far less prevalent. In 2019, four per cent of workers in conditions similar to slavery worked in soybean production.⁸

A Registry of Offending Employers, known as the Dirty List, has been relatively effective as a deterrent against forced labour. Once mentioned on the list, an offender's name remains for at least two years, during which they are ineligible for credit and must prove that they are cleaning up their supply chain. Being on the list makes you a risky investment.

Child labour is also prevalent in Brazil although it also appears to be reducing; in absolute numbers, recorded child labour cases declined from 7.8 million in 1992 to 2.7 million in 2015.⁹

Child labour is prominent in the cattle breeding sector. In 2015 this sector employed 130,027 youths between the ages of 10 and 17 which corresponds to 16.5 per cent of the total number of registered working Brazilian children.¹⁰

In the cultivation of soybeans, in 2015, there were 11,056 children between 10 and 17 years old registered as working, which corresponds to 1.4 per cent of the total.¹¹

³ - These data are derived from INPE (PRODES) data on deforestation in the two biomes.

⁴ - Agroicone, INPUT. 2016. "The Expansion of Soybean Production in the Cerrado; Paths to Sustainable Territorial Occupation, Land Use and Production." São Paulo, SP: Agroicone/INPUT.

⁵ - The Financial Risks of Insecure Land Tenure; The Munden Project; December 2012. Available at: https://rightsandresources.org/wp-content/uploads/2014/01/doc_5715.pdf

⁶ - Pastoral Land Commission (CPT) report Conflitos no Campo: 2019, available: <https://www.cptnacional.org.br/cedoc/centro-de-documentacao-dom-tomas-balduino>.

⁷ - Dirty List of April 5, 2021, published by the Brazilian Ministry of Economy, Secretariat of Labour Inspection.

⁸ - CPT report Conflitos no Campo: 2019, available: <https://www.cptnacional.org.br/cedoc/centro-de-documentacao-dom-tomas-balduino>.

⁹ - Instituto Brasileiro de Geografia e Estatística (IBGE), Pesquisa Nacional por Amostragem dos Domicílios, Child labor statistics, 2015.

¹⁰ - Fundação Abrinq (2017). "Childhood and Adolescence Scenario in Brazil",

¹¹ - Ibid

EU trade links

By importing soybeans and beef from Brazil without sufficient due diligence, the EU indirectly contributes to deforestation and human rights abuses, including child labour. Although 80 per cent of Brazilian beef production is destined for the domestic market and beef exports from Brazil to the EU are considerably lower than those shipped to countries, such as China, Russia and the Near East, the EU remains an important high-value buyer. In 2017, 17.7 thousand tonnes (kt) of deforestation-risk meat was shipped from the Amazon states of Pará and Mato Grosso to EU countries.¹²

The EU is also a large importer of soybeans for animal feed. In 2018/19, 50 per cent of soybeans shipped from Brazil to the EU had a deforestation risk.¹³ The EU was more exposed to deforestation risk from soybeans grown in the Cerrado than in the Amazon, due to both the greater volume of trade and the corporate commitments to avoid buying soybeans derived from deforestation in the Amazon which were made as part of the ‘soy moratorium’.¹⁴



Photo: Lunae Parracho/Greenpeace. Ka'apor people of Brazil find illegal logs inside the Indigenous territory during an operation to set up trap cameras in areas used by illegal loggers.

¹² - Italy – 7.5 kt, Netherlands – 4.6 kt, Spain – 3.2 kt, Germany – 1.1 kt, UK – 0.8 kt, other EU – 0.5 kt according to Trase data (www.trase.earth) quoted in Rajão, Raoni, Britaldo Soares-Filho, Felipe Nunes, Jan Börner, Lillian Machado, Débora Assis, Amanda Oliveira, et al. 2020. “The Rotten Apples of Brazil’s Agribusiness.” Science 369 (6501): 246. <https://doi.org/10.1126/science.aba6646>.

¹³ - The Sustainable Trade Initiative (IDH). 2020. “European Soy Monitor-2018.” Series 2. European Soy Monitor. <https://www.idhsustainabletrade.com/uploaded/2020/05/IDH-European-Soy-Monitor-v2.pdf>.

¹⁴ - The 2006 Soy Moratorium has at its core that companies refuse to buy soy from traders who get their supply from forest destruction, using slave labour or Indigenous lands in the Amazon. It brought together companies, environmental Non-Governmental Organisations (NGOs) and the Brazilian government, and included an independent, robust monitoring system and a powerful enforcement mechanism – aiming to exclude non-compliance from the market.

Box 1: The Forest Code and the CAR (Rural Environmental Registry)

The revision of the Forest Code in 2012 has seriously undermined efforts to reduce deforestation. The new law gave an amnesty to fines for illegal deforestation up to July 2008 and enlarged the forest area that could be legally converted in both the Amazon and the Cerrado.

The new Forest Code includes the Cadastro Ambiental Rural (CAR) which requires all rural properties to be registered and sets caps on the proportion of natural vegetation that can be legally cleared. The proportions to be preserved or restored on each property are 80 per cent in the Amazon; 35 per cent in Cerrado areas within the Legal Amazon region; and 20 per cent in the rest of Brazil.

The CAR is therefore expected to enhance monitoring and enforcement of the Forest Code. To date 6.5 million properties have been registered – of which more than 2.1 million are in the Amazon and the Cerrado. It covers a total of 543.7 million hectares (ha).¹⁵

Implementation of the CAR requires geo-referencing and identification of property boundaries, Legal Reserves (LR), and Areas of Permanent Preservation (APP).

The CAR only applies to private properties. Public protected areas and Indigenous lands are not subject to these rules, and the presence of CAR registries within such areas are an indicator of illegal activity.

Tracking initiatives associated with efforts to reduce deforestation in Brazil have typically taken the CAR as a point of departure. It is possible to cross-reference LR or APP areas that have been deforested (despite being declared in the CAR) with data that traces the source of animals or crop commodities. Such information has been used by slaughterhouses and grain buyers as a filter to exclude suppliers.

Although the CAR is a promising initiative, it is still an imperfect instrument. Problems include inaccuracy and the potential for it to be used to facilitate land grabbing. It is also self-declaratory, meaning there is considerable overlap between declared properties, as well as with public protected areas, Indigenous territories, and traditional communities' lands.

In mid-2021, the Federal Public Prosecutor's office identified nearly 10,000 CAR registries in areas designated as Indigenous territories or that have use restrictions due to the presence of isolated Indigenous groups.¹⁶ The response has been to void these CARs, but the threat persists. Studies by the Amazon Environmental Research Institute (IPAM) suggest that in 10 Indigenous areas where such overlaps exist there is a concentration of deforestation and fire points sighted in databases from the Brazilian national institute for space research (INPE). The study concluded that further CAR registries should be suspended as a means to avoid additional loss in forest cover within Indigenous areas.¹⁷

There is also a risk of deforestation in CAR properties that lie in public undesignated lands (terras devolutas). Some may clear such land so as to claim property rights that could then be titled under the national land regularisation programme.¹⁸ Research has identified a total of 11.6 million ha of undesignated public lands illegally registered as private properties in the CAR system in the Amazon region.¹⁹

Furthermore, considerable effort is still needed to adequately link animal and commodity transport to land use and rights violations associated with the CAR. Recent reporting has linked CAR registration to efforts to exploit mineral resources and to forced labour conditions.²⁰

¹⁵ - Based on data from the unified National System of Rural Environmental Registries (Sistema Nacional do Cadastro Ambiental Rural- SICAR). <https://www.car.gov.br/#/>.

¹⁶ - <http://www.mpf.mp.br/pgr/noticias-pgr/mpf-identifica-quase-10-mil-propriedades-rurais-em-areas-destinadas-a-povos-indigenas>

¹⁷ - Fellows, Martha, Ane Alencar, Matheus Bandeira, Isabel Castro, and Carolina Guyot. 2021. "Desmatamento e fogo nas terras indígenas da Amazônia." Nota Técnica 6. Amazonia em Chamas. Brasília, DF: IPAM. <https://ipam.org.br/wp-content/uploads/2021/03/Amazo%CC%82nia-em-Chamas-6-TIs-na-Amazo%CC%82nia.pdf>.

¹⁸ - Concern with the recent surge in forest fires led INPE to investigate how this relates to the CAR registry. The research cross-checked data on those areas that have registered with CAR and those properties that have not yet been registered with the sighting of fire points. It is extremely troubling that over one third of all fire points sighted in the Amazon in the 2019/2020 burning season were on lands lacking CAR registry, indicating probable land grabbing and the use of fire to open new cropland or pasture. Another third of fire points were sighted on small farms, indicating that the opening of additional forest to production is ongoing in settlements and spontaneous colonisation areas.

¹⁹ - Azevedo-Ramos, Claudia, Paulo Moutinho, Vera Laísa da S. Arruda, Marcelo C.C. Stabile, Ane Alencar, Isabel Castro and João Paulo Ribeiro. 2020. "Lawless land in no man's land: The undesignated public forests in the Brazilian Amazon." Land Use Policy 99: 104863. <https://doi.org/10.1016/j.landusepol.2020.104863>

²⁰ - <https://news.mongabay.com/2021/03/persistence-of-slave-labour-exposes-lawlessness-of-amazon-gold-mines/>

Governmental and NGO Datasets and tools to monitor deforestation and human rights violations

Monitoring deforestation

There are many tools and datasets, some run by the Government and others by non-governmental organisations (NGOs) to monitor deforestation and wider land use in Brazil. Some only focus on the Amazon, others on the Cerrado or Brazil as a whole; some are real time monitoring tools, while others produce annual or bi-annual reports, reflecting different purposes and levels of resolution. Often, users must triangulate between data sources and statistics on the drivers of deforestation to understand the processes at work. Table 1 gives a partial overview.

Deforestation is monitored annually in the Brazilian Legal Amazon region by INPE through its Programme to Calculate Deforestation in the Amazon by Satellite (**PRODES**)²¹ using LANDSAT imagery. PRODES datasets show changes in forest vegetation from one year to the next, with the same baseline date.^{22,23} There are also more sophisticated real time satellite sensors which immediately detect deforestation events (**DETER**)²⁴ to support enforcement actions by federal and state government agencies.²⁵ These datasets and other imagery were also used to reveal pervasive forest degradation in the Amazon (**DEGRAD**). Another tool developed by INPE, called **TerraClass** permits the classification of land use transitions year by year, showing what happens to forests transformed to other uses.

A combination of these instruments, along with the detection of fire points in forested areas, implementation of command-and-control legislation, and credit restraints, has made it feasible to enforce national laws²⁶ against illegal clearing of native vegetation.

This enforcement led to a significant reduction in deforestation from 2004 to 2012, when annual deforestation rates in the Amazon plummeted from a peak of 27.8 thousand to 4.6 thousand square kilometres (km²). However, weakening of the Forest Code in 2012 (see box 1) and increasing laxity in enforcement since 2015 accompanied by an economic and political crisis led to a corresponding return to growth in deforestation rates. Annual deforestation in 2019/20 was double that of 2015.

²¹ - PRODES-Amazonia: (<http://www.obt.inpe.br/OBT/assuntos/programas/amazonia/prodes>).

²² - Both the Amazon and Cerrado PRODES and DETER datasets, overlaid with Indigenous territories and protected areas and the CAR have been compiled in a unified portal called TerraBrasilis (<http://terrabrasilis.dpi.inpe.br/>).

²³ - Issued on an annual basis for the Amazon since 1979, and biennially for the Cerrado from 1990-2012 and annually thereafter

²⁴ - <http://www.obt.inpe.br/OBT/assuntos/programas/amazonia/deter/deter>

²⁵ - Deforestation Detection in Real Time. Images are captured daily from the French SPOT satellite imagery service of the Amazon region since 2004, enabling enforcement of the Forest Code,

²⁶ - The Environmental Crime law (Lei dos Crimes Ambientais - Lei 9605/98)

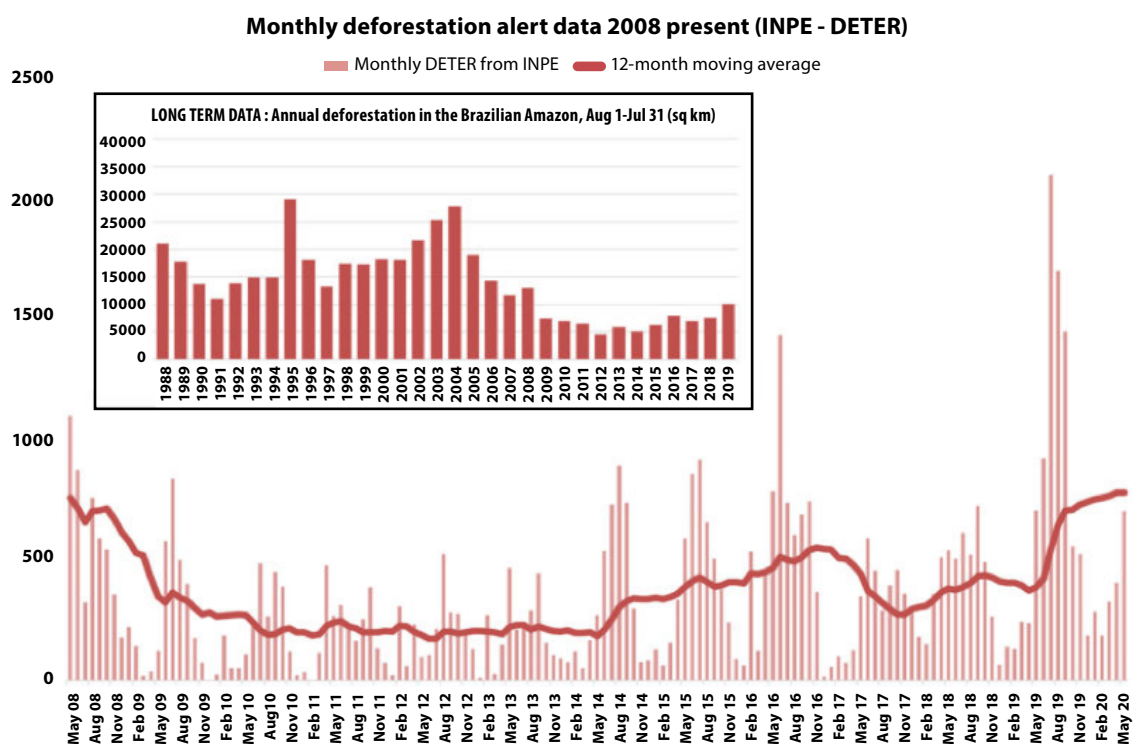


Figure 2. Annual and monthly deforestation rates in the Brazilian Amazon showing how they stabilized at historically low rates from 2009-2014 and then doubled from 2015 to 2019. Y-axes are in km². Source: Mongabay based on PRODES and DETER databases.

Brazil's Federal Public Defender's office (MPF) has recently created an instrument linked to PRODES called **Amazônia Protege** (Amazon Protects) to detect illegal deforestation at the property level. The system cross-tabulates georeferenced data from PRODES with registries of land holdings and regularisation.

MapBiomas (Observatório do Clima)²⁷ and the Deforestation Alert System for Legal Amazonia (**SAD-Imazon**)²⁸ are respected NGO datasets monitoring deforestation. Imazon developed the **SAD** (Deforestation Alert System for Legal Amazonia) that provides a deforestation and degradation tracking system for the Legal Amazon which is often the go-to source for data when delays with the INPE figures impede a timely response. Both sources are widely referenced as being equally or more reliable and timely, since INPE's PRODES data is only released one year after the fact, and under Bolsonaro is underfunded.

²⁷ - <https://plataforma.brasil.mapbiomas.org/>

²⁸ - <https://imazon.org.br/publicacoes/boletim-do-desmatamento-da-amazonia-legal-janeiro-2021-sad/>

Name	Monitoring area	Monitoring topics	Government/ NGO/ Company	Frequency	Resolution *	Alerts
PRODES	Amazon	Deforestation	Government	Annual	60 m (Landsat)	No
	Cerrado	Deforestation	Government	Annual	60 m (Landsat)	No
DETER	Amazon	Deforestation	Government	Daily	250 m (MODIS)	Yes
	Cerrado	Vegetation suppression	Government	Daily	250 m (MODIS)	Yes
FORMA	Tropical Forests	Deforestation	NGO	Daily	250 m (MODIS)	Yes
DEGRAD	Amazon	Degradation	Government	Annually (2006-2016 ²⁹)	6.25 ha LANDSAT& CBERS	No
MapBiomass	Brazil	Land cover / land use / land use change	NGO	Daily	30 m	Yes
SAD Imazon	Amazonia	Deforestation/ Degradation	NGO	Weekly	20-30 m Landsat / Sentinel	Yes (Monthly)
TerraBrasilis (INPE dash-board)	Amazon Cerrado	PRODES, DETER, DEGRAD	Government	Annual and Daily	Various scales	DETER only
TerraClass	Amazon Cerrado	Land use transition	Government/ University (Goias)	Annual (Amazon discontinued in 2014)	30 m	No
Atlas Agropecuario	Brazil	Land tenure / Land Use	NGO / University	Periodic	30 m (MapBiomass data) Tenure –vectoral	No
TRASE	Global	Trade flows (supply chain map)	NGO / University	Annual up to 2018	Municipalities (deforestation-PRODES) / Logistical Hubs	No
GTAP Bio	Global	Trade simulation model	University / NGO	Adaptable	Regions/States	No
Sipam SAR	Amazon	Deforestation	Military	?	3-18 m (SAR radar imagery)	Yes
GLAD (GFW)	Global	Deforestation; Soybean cropland	University of Maryland	Daily; Annual cropland extent	30 m	Yes
Agroideal	Brazil and Argentina	Environmental aptitude and restrictions for soybeans and cattle	The Nature Conservancy (TNC)	Some themes regularly updated	Vector areas by theme (e.g., CAR, embargoes)	No

Table 1: Deforestation, land use and monitoring systems operating in Brazil.³⁰ For a full list of all abbreviations see the full report.

* An image's spatial resolution is defined as the distance represented by each pixel. For example, in NASA's Landsat each pixel represents a 15 metre by 15 metre square.

²⁹ - Substituted by DETER-B from 2017 onward. (<http://www.obt.inpe.br/OBT/assuntos/programas/amazonia/degrad>)

³⁰ - See full report for a complete listing of sources and references.

Additional data on pasture expansion into Brazilian biomes has been developed by the Laboratory for Processing of Images and Geoprocessing (LAPIG) at the Federal University of Goiás (UFGO).³¹ More recently, LAPIG assumed an even more vital role in mapping deforestation and related risks in the Cerrado, having launched in October 2020 the platform Deforestation Polygon Assessment Tool (DPAT), a partnership between UFGO, FIP Monitoramento Cerrado, The World Bank and INPE.³² There are more initiatives detailed in the full report.

Monitoring land tenure conflicts

Several public, academic and NGO databases have been developed to monitor incursions in Indigenous and traditional territories. The National Institute for Colonisation and Agrarian Reform's (INCRA) national public database of certified properties shows the existence of 116.6 million ha in Indigenous Areas, and 2.9 million ha in Quilombo territories.³³

Since these collective property areas with “full property rights” had significantly lower rates of deforestation than territories without such rights between 1982 and 2016, there is a strong argument that formal demarcation of Indigenous areas can help to reduce deforestation rates.

Instituto Socioambiental (ISA) has maintained a complete record of Indigenous lands in the various stages of demarcation and registered the overlap between Indigenous territories and protected areas. ISA has also developed a database that contains georeferenced data for 361 Indigenous territories in the Legal Amazon up to 2017. Since 1985, the Pastoral Land Commission (CPT) has documented and published conflicts over land and cases of violence against people, such as murders, death threats and arrests.

Several academic centres also document interactions between land use, tenure and the Forest Code, including the Laboratory of Ecosystem Services Management managed by Professors Britaldo Soares-Filho and Raoni Rajão at the Federal University of Minas Gerais (UFMG) and the geoprocessing lab led by Gerd Sparovek at the University of São Paulo Agricultural College.

Proprietary mapping and database systems have proliferated among NGOs, including those working with settlers, Indigenous groups and traditional communities in the Amazon, such as Imazon, Instituto Centro de Vida (ICV), IPAM and ISA. The Cerrado is less served by these initiatives than the Amazon.

Monitoring forced labour

There are several systems for monitoring forced labour in Brazil: from the executive branch (Statistics and Information Dashboard of Labour Inspection in Brazil (Radar SIT), from the Federal Government), from the Judiciary (Digital Observatory of the Public Ministry of Labour / Smart Lab), from civil society (with emphasis on the CPT) and the private sector (InPACTO). Although adopting different methodologies, all of them use data provided by the GEFM,³⁴ the federal agency responsible for inspection and the “Dirty List”.



Photo: Katie Maehler / Midia NINJA. Rubber tapper in in Acre, Brazil, where rural workers have accused landowners and police of torture.

³¹ - (UFG/LAPIG 2021) Deforestation Polygon Assessment Tool (DPAT). Federal University of Goiás

³² - <https://cerradodpat.org/#/>

³³ - https://acervofundiario.incra.gov.br/acervo/dados_acervo.php#

³⁴ - The GEFM is a governmental special mobile Inspection Group (1995) inspecting the occurrence of forced labour, checking complaints it receives, rescuing workers and punishing employers for labour violations committed.

Monitoring supply chains and trade

As well as monitoring deforestation, it is also important to monitor trade flows and supply chains involved in deforestation. Trase has linked deforested areas with trade flows, by [i] quantifying commodity-driven deforestation across Brazil's 5,570 municipalities, [ii] identifying the origin of sourcing of trade hubs (e.g., granaries and slaughterhouses) across the country, and [iii] tracking exports from these facilities via trading companies (e.g., Cargill) to importing markets (e.g., Germany, China).

Trase calculates the deforestation risk incurred by each buyer, based on the deforestation happening in the municipalities from which they source products. This includes only 'direct' deforestation, where commodities expand onto recently deforested land, rather than indirect effects where crop expansion, for example, expands onto pasture, with knock-on effects on deforestation elsewhere.

Trase data is published with at least one year's delay, because of lags in the publication and processing of agricultural statistics, shipping data, and remote sensing data.

Combined monitoring

The **AtlasAgropecuário** database joins MapBiomas' high resolution time series on forest cover and agricultural lands at the national level with a variety of tenure mapping sources and tools (including INCRA registries and the CAR) enabling the Institute for Forest and Agricultural Certification and Management (IMAFLOA), a specialised environmental services and research NGO, and partners to develop a platform that allows visitors to visualise property boundaries and how the land is being used by overlaying property lines and land use changes.³⁵

This data has recently been combined with Trase export tracking data, making it possible for researchers to expose fragilities in the environmental licensing of rural enterprises linked to soybean exports from the Amazon and Cerrado regions and from rural enterprises in Mato Grosso.

Similarly, Global Forest Watch (GFW), a forest monitoring platform under the auspices of the World Resources Institute, has added a GFW-Pro module which enables companies to verify the forest status in municipalities where they operate, at a high resolution. This module requires a paid subscription to access and is limited to soybeans, oil palm and wood fibre data on a global level. GFW also added an alert system (FORest Monitoring for Action (FORMA)) which delivers a higher resolution than DETER.

The Nature Conservancy (TNC) has also developed an integrated platform for business planning in the soybean and beef agroindustries called **AgroIdeal**³⁶ which includes information useful for planning the occupation of areas suitable for agriculture that also pose low socioenvironmental risk.

INPE provides a means to overlay CAR registries with deforestation, as well as Indigenous and protected areas in the Amazon and Cerrado regions on its Terrabrasilis dashboard.³⁷ INPE's BDQueimadas database also crosses heat points as being indicative of fire within Indigenous territories and protected areas, including buffer zones. The system provides an analysis of the number of fire points sighted in relation to both deforested areas, properties and Indigenous lands using DETER and CAR registries.

³⁵ - <http://atlasagropecuario.imaflora.org/>

³⁶ - <https://agroideal.org/en/>

³⁷ - <http://terrabrasilis.dpi.inpe.br/>



Photo: Katie Maehler / Midia Ninja. Monitoring deforestation and human rights violations in the Chico Mendes Reserve, Brazil.

Concerns or questions concerning existing data sets

Incomplete weak datasets. One of the most important sources of risk in both the meat and soy value chains in Brazil relates to weaknesses and inaccuracies built into the CAR and other incomplete, overlapping or low-resolution databases. Commodity tracing tools are not yet fully incorporated into a rural property linked database, despite efforts by e.g., Imaflora and partners to provide such mapping in its Atlas Agropecuário and by INPE's Terrabrazilis, OC's MapBiomass, and TNC's Agroldeal, etc.

Landscape level versus property level monitoring. There are pros and cons to either type of monitoring. Municipality level or landscape level monitoring, as adopted by Trase, is cost effective and practical as the basis for estimates of deforestation risk, but a focus on direct or indirect supplier properties is necessary to filter out suppliers who are not in compliance with the forest code, the Term of Conduct Adjustment (TAC)³⁸ or other requirements. The "landscape" approach may allow for the inclusion of indirect suppliers or other environmental impacts of deforestation associated with the presence of deforestation at a municipal scale, given the enormous area of parts of the Amazon. There is also a problem of "false positives" that occurs when properties are regularised but not recognised as such in monitoring databases, cutting off farms from the market undeservedly.

Lack of linkages. The spatially explicit databases should also be able to identify the source of the pressures on Indigenous and traditional properties from surrounding land uses. Yet the public systems do not include details about the surrounding areas.

38 - Termo de Ajuste de Conduta-TAC dos Frigoríficos

Box 2: Tracing cattle

There are two principal cattle tracking systems in Brazil. Both were devised primarily for animal sanitation purposes to enable the tracing of outbreaks of foot-and-mouth and other diseases. The first one is the mandatory cattle transport forms (GTA) which are issued by the Ministry of Agriculture, Livestock and Supply (MAPA). The GTA is applied to lots of cattle (usually by truckload) rather than individual animals. It includes the farm of origin, and information on the owner and the transaction. The second one is the voluntary System of Identification and Certification of Cattle Origin (SISBOV) system, also administered by MAPA. It tracks individual animals whose meat is destined for export. Individual tracking is done by implanting radio frequency identification earrings on each animal and registering each movement to links in the supply chain. This approach was adopted at the EU's insistence to permit Brazil to sell its meat on the EU market, following hoof and mouth outbreaks in Brazil in the 1980s.

SISBOV only certifies ranches as "apt" to export if they conform with sanitary guidelines, which is currently the case in only nine of Brazil's 25 states.³⁹ SISBOV is used by a relatively small number of producers, due to the costs of certification. Only 1,400 ranches are registered in the SISBOV trace list⁴⁰ and hence the majority of beef exported by Brazil does not fall under SISBOV.⁴¹

Neither the GTA nor SISBOV contains information on the environmental status of the farm of origin, but both are increasingly being used to complement environmental monitoring of the origin of cattle. For example, the state of Pará has recently implemented a Green Seal to identify environmentally compliant cattle ranches.

It should be conceptually possible for MAPA to coordinate the monitoring of ranches contaminated by deforestation by cross-referencing those which are non-compliant with the CAR with their corresponding GTAs, thus enabling slaughterhouses to refuse such suppliers. But the major meatpackers have different strategies for responding to the fact that they have so far disobeyed the requirements of the TAC as regards to indirect suppliers and have developed their own initiatives to 'green' their supply chains, often with substantial support from NGOs. A significant number of private geoprocessing and big data analysts have also joined NGOs and academic groups in the race to provide services to the cattle industry and its financial backers to cross tabulate the sourcing of animals with socio-environmental and legal conditions. See full report for more details.



Thiago de Lima Cunha / Shutterstock. Cattle ranches encroaching on the forest.

³⁹ - The "apt" list currently excludes from the EU beef from cattle raised in any of the Amazon states except Mato Grosso, all the Northeast states and Rio de Janeiro (see <https://www.gov.br/agricultura/pt-br/assuntos/sanidade-animal-e-vegetal/saude-animal/rastreabilidade-animal/territorios-ou-partes-do-brasil-autorizados-a-exportacao>).

⁴⁰ - <https://www.girodobo.com.br/destaques/o-sisbov-serve-somente-para-grandes-propriedades/>

⁴¹ - Beef is, however subject to federal inspection at the slaughterhouse of origin according to the Federal System of Inspection (SIF). The major beef packers now link the SIF barcode to the ranch which is the direct source of the animals registered.

How could the EU Forest Observatory use Brazilian data?

For the EU to be able to enforce a regulation that requires companies to mitigate deforestation and human rights risks from their supply chains, companies and governmental bodies need to be able to access various data sets. An EU Forest Observatory could play an important role as a place to collect, harmonise and make public already available data and/or, where required, generate new data.

As this Regulation will not only require companies to set up a due diligence system, but also include thresholds around maximum risk tolerance or a prohibition, data should be accessible on the following issues: deforestation; human rights violations (if included in the final Regulation); different land uses; trade and supply chains (including supply chain traceability and mapping, business relationships and company ownership).

This report considers each of these issues in turn.

Deforestation and human rights violation data

As Table 1 shows, there are many datasets available in Brazil that the EU could use to monitor deforestation. Some organisations generate satellite data themselves, others use data generated by others and interpret it. Given that much of the data covers different timeframes, it could be important to stitch some of this data together.

If the EU legislation were to only focus on deforestation, datasets covering the Amazon, the Cerrado, the Pantanal⁴² and the Atlantic forests as well as the Caatinga would be required. However, the Caatinga doesn't have much relevance for commodity production and the Atlantic Forest has effectively got most deforestation under control, so the focus would really be on the Amazon and the Cerrado, with some residual concern about the Pantanal which has recently suffered severe fires.

While there are sufficient Brazilian forest monitoring data sources available for the EU Forest Observatory, this is not the case for all commodity driven deforestation in all countries. Data quality and coverage varies across countries and commodities, and approaches and datasets are often fragmented with different time series, classifications and geographic scope.

Concerning human rights violations, there is data about land rights conflicts and forced labour, including child labour, but these datasets are less complete, less up-to-date and lack georeferencing. It is therefore more difficult, but not impossible, to include them in an EU Forest Observatory.

Globally, data on human rights violations or social risks is difficult to find. In many countries, data comes from investigative reports by civil society or 'whistleblowing' and hence are based on case studies rather than systematic analysis.

⁴² - The Pantanal is a traditional supplier of good quality beef on open natural rangelands that are inundated in the rainy season.

Data showing who owns and/or uses the land; indicating where mills and storage places are etc.

To enforce the Regulation on deforestation-free products, it will be important to link deforestation and human rights violations with the commodities produced on that land/by that operation. The EU therefore needs to know who the landowner or concessionaire is and what the land-use is, taking into account that the land title may belong to someone other than the user of the land, who could be a *laranja*, someone who serves as a front for an illegal activity so as to help the owner avoid identification.

In Brazil, the CAR provides an imperfect starting point for ownership and land use data and there are several initiatives linking CAR data with deforestation data at the governmental level as well as by NGOs. Again, others are tracing interlocking ownership structures, subsidiaries and joint ventures with Brazilian *laranjas* over corporate land going back to original investors.

Nonetheless this data is more difficult to collect than deforestation data. Also, as Trase points out, decent production data is difficult to get. Hence, although deforestation data is widely available and data on human rights violations and possible land tenure violations is possible to compile, linking this with localised production of forest risk commodities is more difficult.

For the EU to request companies and countries to map all concessions and link them with ownership data would be a great step forward. Globally the coverage of commodity production (crops, pasture, plantations) regions is still too crude or too dated to be valuable for real-world monitoring requirements. Improvements would be required to link deforestation in a particular area with a farm, county or region. Isotope testing, which is up-and-coming, could make it easier to link a commodity to its location of origin.

Supply chain data

Once a commodity has been linked to deforestation or human rights violations, it should be followed through the supply chain to link it with the companies putting it on the EU market. As most of the environmental and social risks are linked to production and processing facilities, volumes need to be traced back through each stage of the supply chain to these production and processing facilities. A company must therefore be able to trace the origin of its products to be able to assess and mitigate any environmental or human rights risks.

To be able to trace its products, a company would need to map all suppliers (names and locations) and known sourcing facilities and be able to link these with risk data (e.g., the dirty list and TAC audits) and deforestation data. In the case of beef from Brazil, it would require linking the SISBOV system, GTA data, the TAC and also municipal origin data provided at the slaughterhouse level by the Federal Inspection Service. This service provides options to map cattle movements and link the cattle from slaughterhouses back to farm level.

Mapping all suppliers is, however, complicated for companies with long supply chains and/or with many indirect suppliers, or those buying on the spot market (where goods are traded for immediate delivery), of which there are many in the agriculture sector. It is also complicated for companies trading in or using commodities produced by large numbers of smallholders, like coffee, cocoa and palm oil.

Governments collect relevant trade data on imports for customs and tax purposes. This per shipment data provides information on the product, volume, importer and exporter as well as port of export and therefore can connect imports to either companies and/or regions that may be identified as high risk. In the United States, this data is available, at a cost. The EU, however, does not publish detailed customs or import data.⁴³

To help address these complexities, it would be helpful if the EU required companies to disclose their source and make detailed customs data available. Harmonised System (HS) codes combined with port of export would provide a lot of information to track the commodity back to the source. Customs data has a tax code that can link meat back to the slaughterhouse.

Caveats relevant to datasets

Reliable data: For the EU Regulation to be effectively implemented, it will require EU competent authorities to have access to data that is accessible, independent and reliable. That is, however, easier said than done. What the EU considers independent and reliable may be disputed by producer countries and/or NGOs; what NGOs consider independent and reliable may be disputed by both the EU and producer countries. In Brazil the underlying official data on coverage permits is reliable but incomplete; land tenure data is likewise notoriously incomplete, overlapping, corrupt and difficult to sort out. **For the EU to assess the reliability of data sources, having a group of experts peer reviewing data or informing EU decisions is important.**

What data can't be tracked: Supply chain management is not capable of dealing with all deforestation risks. Although tracking agricultural products and beef may enable traders to refuse goods connected with direct deforestation, there may well be leakage and indirect knock-on deforestation through several pathways, including:

- 1) displacement of pasture by annual cropland and increased land rents, leading to encroachment on native forests elsewhere (leakage); there is some evidence this is occurring in relation to the soy moratorium which has led to soybean expansion into areas previously occupied by cattle or into the Cerrado.
- 2) domestic demand deficit caused by export desirability leads to further pressure on native vegetation to provide additional meat for the national market (80 per cent of current demand); and
- 3) deregulation of environmental and land use safeguards including Indigenous territories to permit greater production for export markets.

Cut off dates: Assuming the legislation calls for a cut-off date for when deforestation took place, in the case of Brazil, July 2008 would be a logical date, which is also the cut-off date in the Forest Code and the Soy Moratorium.

⁴³ - The French Government as part of its national deforestation action plan, is now creating a public information system which will include French customs data with the vision that imported commodities can be linked to risky areas and provide a risk alert to companies using the system that can trigger more in depth due diligence efforts.

Conclusions and recommendations

Brazil has a lot of monitoring systems related to deforestation and human rights, but currently lacks effective enforcement, which will only come with increased political will. State governments and NGOs have therefore become the hothouses for innovation in monitoring of commodity movements and associated deforestation and human rights violations. In all cases, monitoring is only a tool and should be seen as such. To have an impact on deforestation and rights abuses, it must go hand in hand with legislative requirements and corporate commitments as well as state enforcement.

Leakage is always possible, so any EU action must be accompanied by demand side legislation from other consumer countries beyond the EU, such as the United States and China, as well as supply side measures that enhance and strengthen improvements in governance. See Fern's report 'Getting the Incentives Right'.⁴⁴

In terms of the Forest Observatory and the draft Regulation on deforestation-free products, we have the following recommendations:

For Brazil, the Forest Observatory should:

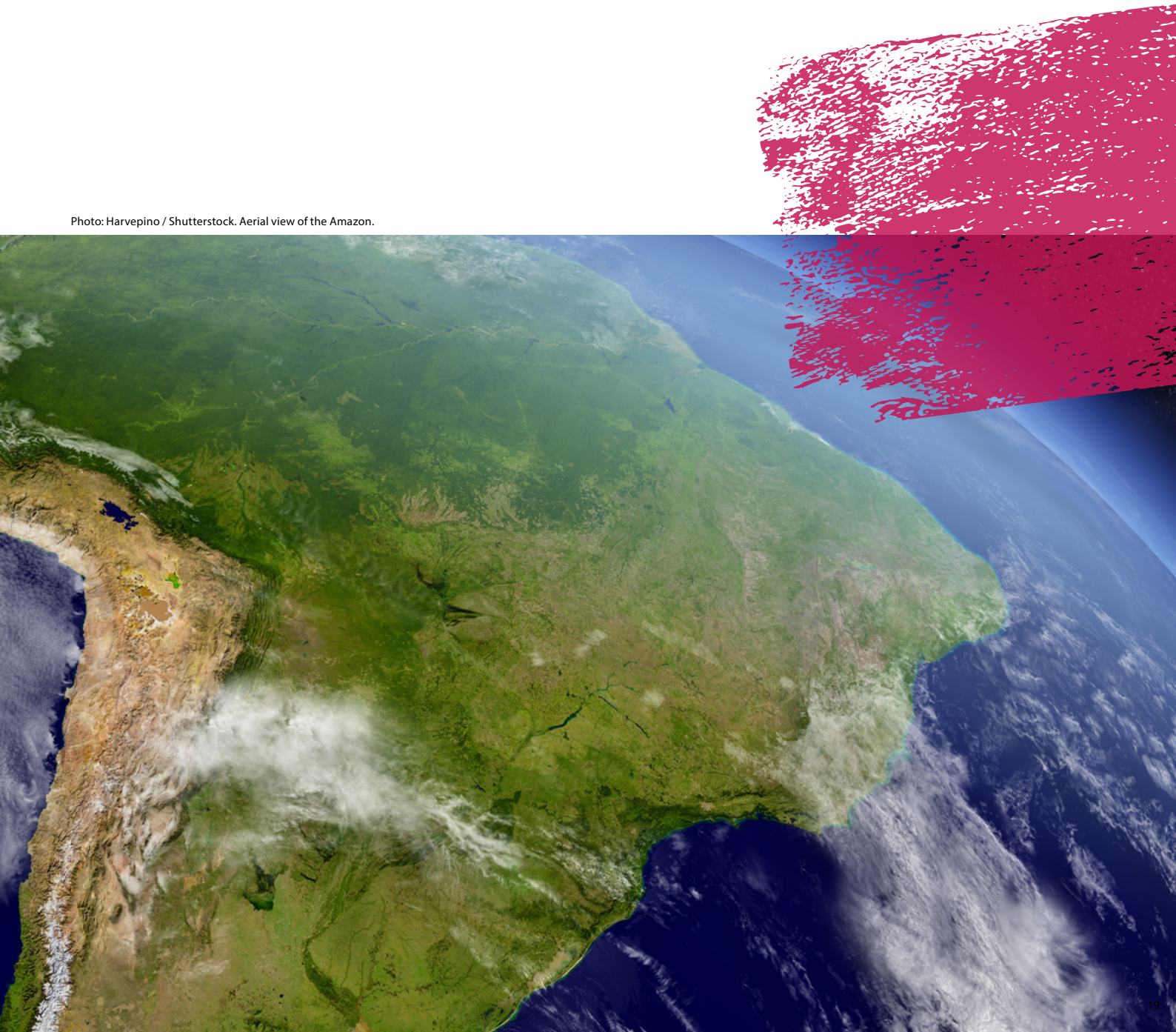
- Be the "go to" point for information for independent observers and those involved in implementing and enforcing the Regulation.
- Simplify monitoring by harmonising and aligning existing datasets where possible.
- Build on the many existing monitoring tools. In Brazil this would mean starting from PRODES and DETER and folding-in PRODES, DETER-Cerrado, TerraClass, fire points monitoring and others. MapBiomas has also become a go-to source for real time monitoring and analysis. If there is an official data source (e.g., INPE) already used for legal enforcement, then it should continue to be used.
- Build on currently available data in close cooperation with local NGOs, academics and governments.
- Go beyond crude national-level monitoring by asking countries to calculate and report sustainability risks at a subnational (e.g., state) level. Companies can then use this information to 'risk screen' specific assets (e.g., slaughterhouses, silos) that supply them, based on the risk in the jurisdictions where they are located.
- Map out who needs to have access to which data and how to best facilitate this access, considering public entities, consumers, companies and competent authorities.
- Consider the data capacity of target users, which tend to be low and ensure the data is delivered in a format that is usable and interpretable.
- Link with databases documenting company actions such as policies, audits, and NGO actions including whistleblowing. This is particularly relevant when it comes to human rights where spatial data is not always helpful/available.
- Look for new scientific testing methodologies like DNA analysis and isotope testing and integrate them. For example, isotopic testing is developing fast and would deliver location authentication.

44 - <https://www.fern.org/publications-insight/getting-the-incentives-right-2236/>

The EU Regulation on deforestation-free products should:

- Provide disaggregated customs data for all forest risk commodities and where relevant the tax codes - this would make tracing shipments much easier.
- Ensure all relevant customs codes are included, including for processed products such as canned beef, and leather.
- Require companies and countries to map all existing concessions and allow for these to be linked with ownership data.
- Support jurisdictional initiatives to regularise land use and ensure recognition of local communities' and Indigenous Peoples' customary tenure rights.
- Consider concerns on the inclusion of timber. The Food and Agricultural Organisation of the United Nations's definition of deforestation focuses on land-use change. In many cases, logging does not lead to land-use change and hence timber may not be captured properly unless it includes a strong mechanism to tackle degradation.

Photo: Harvepino / Shutterstock. Aerial view of the Amazon.





Fern is a non-governmental organisation (NGO) created in 1995 with the aim of ensuring European policies and actions support forests and people. Our work centres on forests and forest peoples' rights and the issues that affect them such as aid, consumption, trade, investment and climate change. All of our work is done in close collaboration with social and environmental organisations and movements across the world.

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"Monitoring is only a tool and should be seen as such. To have an impact on deforestation and rights abuses, it must go hand in hand with legislation, corporate commitments and state enforcement."

