A DEFORESTATION AND RIGHTS OBSERVATORY

A CASE STUDY FROM BRAZIL

How the European Union can best integrate deforestation and rights violations data in its regulatory proposals
Acknowledgements

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<td>ABIEC</td>
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<td>ABIOVE</td>
<td>the Brazilian Association of Vegetable Oils Industries</td>
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<td>Abrinq</td>
<td>Brazilian Association of Toy Manufacturers</td>
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<td>Accountability Framework Initiative</td>
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<td>AU</td>
<td>Animal Unit</td>
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<td>CAR</td>
<td>Brazilian Rural Environmental Registry</td>
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<td>CDP</td>
<td>Carbon Disclosure Project</td>
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<td>Climate and Land Use Alliance</td>
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<td>National Economic Activity Code</td>
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<td>COETE</td>
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<td>European Environment Agency</td>
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<td>EFFIS</td>
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<td>ETC-CCA</td>
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<td>European Union</td>
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<td>EUFORGEN</td>
<td>(EUFOR is the EU military programme as Saskia rightly pointed out! #SmartSaska)</td>
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<td>Brazilian Forum for Climate Change</td>
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<td>FINPETI</td>
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<td>Global Environment Facility</td>
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<td>GEFM</td>
<td>Special Mobile Inspection Group</td>
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<td>GFW</td>
<td>Global Forest Watch</td>
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<td>Cattle transport form</td>
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<td>GTFI</td>
<td>Working Group on Indirect Suppliers</td>
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<td>GMO</td>
<td>Genetically Modified Organism</td>
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<td>hectare</td>
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<td>Municipal Human Development Index</td>
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<td>Human Rights Watch</td>
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<td>HS</td>
<td>Harmonised System</td>
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<td>Brazilian Institute of Geography and Statistics</td>
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<td>ICV</td>
<td>The Life Centre Institute</td>
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<td>ICP-Forests</td>
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<td>Institute of Studies for Health Policies</td>
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<td>International Labour Organisation</td>
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<td>InPACTO</td>
<td>National Pact Institute for the Eradication of Forced Labour</td>
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<td>INPE</td>
<td>National Institute of Space Research</td>
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<td>IOS</td>
<td>Social Observatory Institute</td>
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<td>IPAM</td>
<td>Amazon Environmental Research Institute</td>
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<td>IPEA</td>
<td>Applied Economic Research Institute</td>
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<td>ISA</td>
<td>Instituto Socioambiental</td>
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<td>ISPN</td>
<td>Society, Population and Nature Institute - a national NGO</td>
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<td>LAPIG</td>
<td>Laboratory for Processing of Images and Geoprocessing</td>
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<td>List of Illegal Deforestation</td>
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<td>MAPA</td>
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<td>MST</td>
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<td>MTE</td>
<td>Ministry of Labour and Employment (now extinct)</td>
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<td>NGO</td>
<td>Non-Governmental Organisation</td>
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<td>NWF</td>
<td>National Wildlife Federation</td>
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<td>OC</td>
<td>Climate Observatory</td>
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<td>Abbreviation</td>
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<td>OSCIP</td>
<td>Civil Society Organisation in the Public Interest</td>
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<td>PAI</td>
<td>Integrated Action Plan</td>
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<td>PETI</td>
<td>Child Labour Eradication Program</td>
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<td>PF</td>
<td>Federal Police</td>
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<td>PNAD</td>
<td>National Household Sample Survey</td>
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<td>PRA</td>
<td>Plano de Restauração Ambiental</td>
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<td>RADD</td>
<td>Radar for Detecting Deforestation</td>
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<td>Integrated Action Network to Combat Forced Labour</td>
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<td>RDS</td>
<td>Sustainable Development Reserve</td>
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<td>REPAM</td>
<td>Pan-Amazonian Ecclesial Network</td>
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<td>RESEX</td>
<td>Extractive Reserves</td>
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<td>RFI</td>
<td>radio frequency identification</td>
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<td>SDG</td>
<td>Sustainable Development Goals</td>
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<td>SFB</td>
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<td>SFX</td>
<td>São Félix do Xingú</td>
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<td>SICAR</td>
<td>National System of Rural Environmental Registries</td>
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<td>SIF</td>
<td>Federal Inspection Service</td>
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<td>SIGEF</td>
<td>System of Land Management</td>
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<td>SINAN</td>
<td>Notifiable Diseases Information System</td>
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<td>SISBOV</td>
<td>System of Identification and Certification of Cattle Origin</td>
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<td>SISNAMA</td>
<td>National System of the Environment</td>
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<td>SIT</td>
<td>the Ministry of Economy’s Subsecretariat for Labour Inspection</td>
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<td>SNCR</td>
<td>National System of Rural Registry</td>
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<td>SUAS</td>
<td>Unified Social Assistance System</td>
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<td>TAC</td>
<td>Term of Conduct Adjustment</td>
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<td>List of the worst forms of child labour</td>
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<td>Federal University of Lavras</td>
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<td>UNEP</td>
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<td>UNICEF</td>
<td>United Nations Fund for Children</td>
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<td>University of São Paulo</td>
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<td>ecological-economic zoning</td>
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1. Executive summary

Deforestation and related human rights violations in tropical regions have sparked concern among consumers of agricultural and timber products derived from forestlands in these regions whose conversion is in part due to export demand. As a result, the European Union (EU), United Kingdom (UK) and United States (US) are simultaneously considering legislation to restrict imports of such goods in hopes of averting social and environmental harm. Demand side pressures from corporate supply chain commitments and purchase policies must however be coupled with capacity on the supply side to both monitor and enforce restraints against illegal or destructive practices.

The 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. The objective is to facilitate access to information on supply chains for public entities, consumers and businesses.”

This study reviews the experience in monitoring deforestation and associated land tenure and human rights violations in the Amazon and Cerrado regions of Brazil linked with soybean and beef cattle expansion. By importing soy and beef from Brazil without sufficient due diligence the EU indirectly contributes to deforestation and human rights abuses, including child labour.

Soybeans now occupy over half of all Brazilian arable land, while planted pastures are responsible for much of the deforestation that has occurred in the Amazon. Guided by a multi-stakeholder panel, efforts to curb conversion of forests to soybean cultivation in the Amazon through a Moratorium have been successful, but parallel controls over beef cattle have yet to reach indirect suppliers responsible for a large share of both deforestation and forced labour practices. Neither soy nor beef cattle are subject to such control in the Cerrado, where much of the recent expansion has occurred in areas that can be legally deforested under the national Forest Code.

Land tenure conflicts have erupted at the frontier in undesignated public forestlands, protected areas and Indigenous territories. While government seeks to regularise property rights over land occupied in such areas, land occupants seeking title can use the self-declared rural environmental cadastre as a foot in the door for regularisation. Many such claims overlap with protected areas or other public lands and are associated with deforestation and burning. A large part of the discernible cases of forced labour and child labour in Brazil are associated with rural activities in the cattle raising sector. Resolution of such cases under the responsibility of the Public Labour Prosecutor is facilitated by the regular publication of infractions in a federal “dirty list”.

Monitoring capacity over deforestation has been perfected to a great degree by the national space research institute (INPE), whose databases are freely available and widely used by state and federal agencies as well as by NGOs and academic researchers. Alerts are posted in real time by the same organisation serving to initiate enforcement actions in illegally deforested areas.

There are sufficient forest monitoring data sources available in Brazil for the EU to use in its Forest Observatory. The feasibility of tracing commodities to production areas is nevertheless limited. Beef is primarily tracked only by sanitary authorities by lots rather than individual animals and may be as many as five removes from their point of origin by the time they reach the slaughterhouse; only the direct suppliers are traceable. Support for jurisdictional approaches to tracing and production practice improvement may be one means to overcome the limitations of direct tracing.

* - Information from a presentation by Giovanni de Santi of the EU Joint Research Center (JRC); Establishment of an EU Observatory on deforestation, forest degradation and changes in the world’s forest cover and associated drivers; 2 October 2020.
2. Background to this research

WHAT IS THIS STUDY ABOUT?
This Fern study aims to inform European Union (EU) planned legislation to address deforestation and human rights violations by learning from forest and human rights monitoring systems in Brazil and understand whether or how these could inform ongoing EU initiatives.

The EU is developing two pieces of regulation that will impact companies trading in Forest Risk Commodities (FRC). The first one, being developed by DG Justice, will require all companies to carry out a due diligence process to mitigate environmental and social harm from their supply chains.

The second one is being developed by DG Environment and aims to ensure companies remove deforestation and, hopefully, human rights violations from their supply chains. At the time of publication, it is not yet clear what form these two legislative proposals will take nor how they will relate to each other.

These legal initiatives follow the publication of an EU Action Plan first announced in 2008 and finally published in July 2019 under the title ‘Stepping up EU Action to Protect and Restore the World’s Forests.’ The European Parliament has also been pro-active by adopting a report in October 2020 proposing an EU legal framework to halt deforestation.

Once these two legal proposals have been published, the European Parliament and the Council, consisting of all 27 EU Member States, will amend and — after a process that can easily take two years — adopt these new laws.

Inter alia to guide the implementation of the ‘deforestation law’, the EU Action Plan mentions the EU intends to establish an EU Observatory. This Observatory will focus ‘on deforestation, forest degradation, changes in the world’s forest cover, and associated drivers. The objective is to facilitate access to information on supply chains for public entities, consumers and businesses.”

WHAT IS BRAZIL MONITORING?
Despite troubling developments in Brazil concerning deforestation and violation of Indigenous Peoples’ rights, Brazil still has the most comprehensive system in place to monitor deforestation through its PRODES and DETER systems. It also has several promising initiatives that allow the public and private sector to scrutinise beef and soy production for deforestation in the Amazon and Cerrado biomes.

There does not appear to be a system yet that links the production of commodities and the trade in these commodities to violation of customary tenure rights, which are very prevalent in Brazil, nor with other human rights abuses, e.g., forced labour. The important efforts by civil society and the public sector to document such abuses should be made part of a monitoring strategy.

THIS REPORT
This report aims to generate a shared understanding (1) of how current policy and legislative proposals in Brazil, e.g., that link property data with export of forest risk commodities can be used by the EU and (2) what data is being collected concerning the violation of customary tenure rights and other human rights or how these could be compiled.

Based on this understanding, the study comes with recommendations on how the EU’s legislative processes and the Observatory could use these data and whether or how data concerning human rights violations could included.

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1 - Communication on Deforestation; Addressing the challenges of deforestation and forest degradation to tackle climate change and biodiversity loss; COM (2008) 645 final.
4 - “To improve the availability and quality of information, and access to information on forests and supply chains, the Commission proposes the creation of an EU Observatory on Deforestation and Forest Degradation, to monitor and measure changes in the world’s forest cover and associated drivers. This resource will give public bodies, consumers, and businesses better access to information about supply chains, encouraging them to become more sustainable. The Commission will also explore the possibility of strengthening the use of the Copernicus satellite system for forest monitoring.” Available at https://ec.europa.eu/commission/presscorner/detail/en/IP_19_4470
5 - The thinking appears to be that this Observatory would provide an “Early warning system on changes in forest cover related to consumption of commodities and products.” It would monitor trade flows of EU imports of Forest Risk Commodities (FRCs) and products, using trade statistics and focus on ‘hot spots’. Information from a presentation by Giovanni de Santi of the EU Joint Research Centre (JRC); Establishment of an EU Observatory on deforestation, forest degradation and changes in the world’s forest cover and associated drivers; 2 October 2020.
3. Deforestation and rights violations driven by agricultural expansion in Brazil

HOW BIG IS THE PROBLEM?
The connection between basic commodity exports and deforestation has been a perennial feature of the Brazilian economy, through historical cycles of sugarcane, coffee and most recently beef and soybeans. These cycles, largely fuelled by international demand, led the occupation of Brazil in successive waves at the agricultural frontier, most recently in the Cerrado and Amazon biomes. Figure 1 shows the distribution of Brazilian states and macroregions overlaid on biomes.

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).

6 - Microregions are groupings of municipalities. Macroregions are groupings of states (there are five: Northeast, North, Central-West, Southeast and South – see Figure 1.)
The Brazilian cattle herd is the world’s second largest, having reached 215 million head by 2019. Pasture expansion into the Amazon has been ongoing for 50 years, driven initially by financial stimuli and land concessions during the military regime in the 1970s. By 2019, nearly 50 million head of cattle were being raised in the North (Amazon) region, and an additional 75 million in the Central-West (Cerrado), together accounting for more than half the total national herd.

Deforestation is primarily driven by agricultural expansion in Brazil, having degraded over 20 per cent of the native vegetation of the Amazon and 50 per cent of the Cerrado biome by 2020. The tonic of such expansion has been on exploitation and degradation of forest resources and their replacement with pasture grasses to feed a cattle herd kept at very low stocking rates (0.97 Animal Units (AU)/ha on average, though with carrying capacity of 3.6 AU/ha). It is estimated that 40 per cent of all pastures in Brazil can be considered moderately or severely degraded (UFG/LAPIG 2021); and consequently, have very low beef productivity.

Soybean cultivation began in the temperate South of Brazil, and gradually shifted to the west and northward (Figure 3). Land use transformation to cropland in the Cerrado has become pronounced. Soybeans were initially restricted to Southern Brazil until the 1980s, when the Brazilian National Agricultural Research Corporation (Empresa Brasileira de Pesquisa Agropecuária—Embrapa) with Japanese technical assistance developed a formula for soil adjustment to enable genetically adapted soybean seeds to absorb nutrients from deeply weathered acid savanna soils. Soybeans fix nitrogen from the air, so what was needed was heavy liming and phosphorous fertilisation to enable soybeans to be cultivated at large scale in the Cerrado.

Within the Cerrado, the Matopiba—a region that includes portions of Maranhão, Tocantins, Piauí, and Bahia states—has been at the forefront of agricultural expansion since 2000, with the soybean area increasing by 253 per cent between 2000 and 2014 (Agroicone, INPUT 2016). As Fig. 4 shows, most of the agricultural expansion in the Cerrado was at the expense of native vegetation, particularly in the Matopiba region. In 2019, Brazil harvested 35.9 million ha of soy, or 48 per cent of the country’s total annual crop harvest area (75.3 million ha) (IBGE 2020).

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8. One animal unit (AU) refers to the pasture consumed to raise a 1000-pound (450 kg) beef cow. These stocking rates imply that for each animal raised, an entire hectare of forest must be cut, leading (in the Amazon) to the emission of an average of up to 150 tonnes of Carbon Dioxide to the atmosphere.
A DEFORESTATION AND RIGHTS OBSERVATORY: A CASE STUDY FROM BRAZIL.

Figure 4. Agricultural expansion in the Cerrado 2000-2014, showing encroachment on native vegetation, by state (GO-Goiás, MG-Minas Gerais, MS-Mato Grosso do Sul, MT-Mato Grosso, SP-São Paulo, PR-Paraná, DF-Federal District, MA-Maranhão, TO-Tocantins, PI-Piauí, BA-Bahia). Source: (Agroicone, INPUT 2016)

BETWEEN 2000 AND 2007

Source: GEMAP (CPDA/UFRRJ) based on data from IBGE Municipal Agricultural Production Yearbook. GEMAP is the Study Group on Social Change, Agribusiness and Public Policies at the Federal Rural University of Rio de Janeiro. Infographic by Valdemar Weisz, Jr.

Figure 3. Area cultivated with soybeans: 1973-2018, in hectares Source: Piras et al. (2020)
OVERVIEW OF ROLL BACK OF ENVIRONMENTAL LEGISLATION
A substantial rollback in environmental legislation and civil society representation has occurred since the Bolsonaro administration took office in 2019. Some of the most significant changes affecting concerns for deforestation and human rights are listed in Annex 2 to this report. In broad terms, the federal government has reneged on most of the advances that had heretofore been made towards a concerted approach among national and state authorities to combat deforestation in the Amazon and Cerrado, while removing safeguards and exposing Indigenous Peoples and traditional communities to invasion for mining and pillage of forest resources.

The most significant change affecting Brazil’s national environmental legislation was due to legislation making the national Forest Code more flexible in 2012. The original Forest Code, passed in 1965, specified that all landowners were required to maintain Legal forest Reserves (RL – Reservas Legais) in addition to areas for permanent preservation (APP – Áreas de Proteção Permanente) along stream beds, on steep slopes and hilltops on their land. That version of the Forest Code had allowed landowners to clear up to 50 per cent of their legal reserves in the Amazon biome; after 2001, this was adjusted to 80 per cent by a provisional measure, and only permitted to remain at 50 per cent if ecological-economic zoning (ZEE) were in force or if over two-thirds of the territory pertained to public protected areas or Indigenous lands, permitting consolidated occupation of remaining areas (Raoni Rajão, personal communication).

The new legislation (Law No. 12.727) gave an amnesty to fines for illegal deforestation in RL that had occurred prior to July 2008 and exempted all lands deforested in RL by smallholders (those occupying properties managed on a family basis under 4 fiscal modules in size or between 280 and 440 ha in the Amazon). The law now requires that all landowners be registered with the national Rural Environmental Registry (Cadastro Ambiental Rural — CAR), demarcating APP and LR on their properties; the remainder of their land could be deforested legally. But the area previously designated as APP was drastically reduced, leaving streambanks and hillsides largely unprotected (Soares-Filho et al. 2014). Furthermore, LR and APP were allowed to cumulatively meet the biome-specific protection targets. These changes substantially enlarged the area that could be legally converted in both the Amazon and the Cerrado (Soares-Filho et al. 2014).

DEFORESTATION RISK IN EU BEEF AND SOY SUPPLY CHAINS FROM BRAZIL
In the Trase (Transparency for Sustainable Economies) system developed by Stockholm Environment Institute (SEI), Global Canopy Project and collaborating institutes, hubs in Brazil have been linked with respective trade flows to identify the deforestation risk that commodities bear to their final destinations. Trase uses sourcing data derived from sales receipts, bills of lading and transport records to connect granaries and slaughterhouses in municipalities where deforestation has been identified in association with crop or pasture expansion with their buyers overseas to identify the deforestation risk associated with such purchases. The risk in terms of ha deforested/1000 tonnes of product is calculated by Trase using information on crop yields, animal stocking rates and forest conversion to make way for new pastures or cropland in the vicinity of the exporter. Indirect effects of knock-on deforestation from crop expansion are not estimated due to uncertainties (zu Ermgassen et al. 2020).

Figure 4 shows the scale of annual trade flows of soybeans mapped by Trase from Brazil to countries in the EU on average from 2009-2017, indicating that the Netherlands was the largest importer (0.7 million metric tonnes (M mt)), followed by Spain (0.4 M mt), France and Germany (0.2 M mt each), and other countries less than 0.1 M mt each. The EU was more exposed to deforestation risk from soy grown in the Cerrado than in the Amazon, due to both the greater volume of trade and to corporate commitments in effect to avoid soy derived from deforestation in the Amazon (see section 4, below). Overall, 50 per cent of soybeans shipped from Brazil to the EU had deforestation risk and 41.2 per cent of soybean equivalent exports (including meal) from the Cerrado to the EU showed such risk in 2018/19 (The Sustainable Trade Initiative (IDH) 2020).
Beef exports from Brazil to the EU are considerably lower than that shipped to other countries, such as China, Russia and the Near East; in the latter, imports of live animals for slaughter in halal facilities also provoke concern for animal welfare. Furthermore, 80 per cent of Brazilian beef production is destined for the domestic market. Nevertheless, Trase identified 17.7 thousand mt of meat with deforestation risk shipped from sources in the Amazon states of Pará and Mato Grosso to EU countries in 2017 (Italy – 7.5k mt, Netherlands – 4.6k mt, Spain – 3.2k mt, Germany – 1.1k mt, UK – 0.8 k mt, other EU – 0.5k mt) (Rajão et al. 2020).

OVERVIEW OF HUMAN RIGHTS VIOLATIONS

Among the most contentious issues facing Brazil today are the conflicts of usufruct rights of native peoples in contested frontiers at the agropastoral frontier. The rights of Indigenous and traditional peoples to their territories is clearly specified in the 1988 Constitution, which provides a legal basis for demarcation of Indigenous lands and the granting of title to Quilombolas (descendents of slaves who settled on common property). Since that time, according to the Instituto Socioambiental (ISA) “Terras Indígenas” dataset, 67.3 per cent of lands (487 Indigenous lands) claimed by Indigenous groups have been fully demarcated and officialised, but there are some 237 territories that have been identified on nearly 10.5 million ha that are still not demarcated. In its annual report on 2019 the Indigenist Missionary Council of the Catholic Church (CIMI) alerted to a dramatic increase in episodes of invasion, illegal resource exploitation and damage to Indigenous patrimony since the beginning of the Bolsonaro administration, which suspended all demarcations in progress and insisted on a review of those that had been concluded. According to Comissão Pró-Índio of São Paulo, only 136 or 7.1 per cent of the Quilombola rights on the 1,916 such properties in some stage of the process of demanding legal recognition have been officially titled. Lack of titling and demarcation opens the door to incursion for agriculture, timber extraction and mining.

Figure 4. Trase mapping of annual soybean equivalent flows from Brazilian biomes to buyers in EU countries: 2009-2017 average
(Source: (Rajão et al. 2020).

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9. https://pib.socioambiental.org/pt/Situaca%C3%A7%C3%A3o%20juridica%20das%20TIs%20no%20Brasil%20hoje
The Bolsonaro administration has declared that it will not demarcate any further Indigenous territories during its mandate. Also, under guidance of the FUNAI president, prosecutors are dropping lawsuits to demarcate Indigenous Lands, including those with favourable decisions, preventing peoples from moving into territories that are not demarcated. Environmental licensing and other title regularisation functions for Quilombolas formerly managed by the Palmares Foundation, a former division of the Ministry of Culture were transferred to the National Agrarian Reform Institute (INCRA), within the Ministry of Agriculture, while other functions were retained under the Ministry of Citizenship (Ministério de Cidadania).

The number of conflicts over Indigenous territories and smallholder property rights has been closely monitored by human rights organisations such as ISA, Indigenist Missionary Council (CIMI), the Pastoral Land Commission (CPT) and Human Rights Watch (HRW). Disputes are brought to the attention of the Federal Public Prosecutor’s (MPF) 6th Chamber, responsible for overseeing cases related to violence and land tenure conflict against Indigenous and traditional communities, which has compiled a compendium of cases related to such disputes and relevant jurisprudence (see Section 5). Land conflicts have arisen between traditional communities and agribusiness enterprises in various parts of Brazil, notably in the Cerrado where recent revelations of land investments originating in pension funds in the United States have erupted in court cases (see Section 5). Although the databases and annual reports on land tenure conflict published by the CPT provide information on the scale of the problem, they do not provide georeferenced locations of where these conflicts have arisen, making it difficult to trace the relationship between commodity production and conflict over land or territorial rights.
Forced and child labour have been addressed by the Brazilian government through the establishment of a legal and institutional framework centred upon the Public Ministry of Labour (Ministério Público de Trabalho-MPT) and the Secretary of Labour (now incorporated within the Ministry of Economy) whose mobile inspection unit is responsible for identifying and — with the judicial support of the MPT — rescuing workers who are subjected to labour relations analogous to slavery. The labour inspection service is also responsible for keeping a “dirty list” of those who cause infractions who are then impeded from access to credit and public incentives until their judicial sentences have been served. When buyers undertake due diligence they will see which companies are on the list and may decide not to purchase from them. Nevertheless, there are no instruments beyond this “naming and shaming” of those involved in forced labour activities including child labour. Although a total of nearly 55,000 labourers under such practices have been freed since efforts began in the 1990s, their perpetrators have often been able to escape punishment and have their names removed from the “dirty list”. In fact, most child labourers – children under 14 years of age employed illegally – work for members of their direct family, to help them reduce production costs and provide for household necessities. Thus, even if children are “rescued” from such conditions, recidivism is common.

Several NGOs are also supporting efforts to eliminate forced and child labour in Brazil. The CPT, besides tracking land tenure conflicts, also publicises and undertakes campaigns against forced and child labour in the countryside (Section 6). The Instituto Ethos, a sustainable business NGO which partnered with several companies and other entities such as Repórter Brasil, a research and journalistic organisation to create a Pact against forced labour. The Brazilian Association of Toy Manufacturers (Associação Brasileira de Fabricantes de Brinquedos-Abrinq) was instrumental in efforts to inform and educate the public and potential child labourers of the risks this entails, with a particular emphasis on the dangers of child labour in agriculture and agribusiness activities. Nevertheless, these nongovernmental initiatives have recourse only to official public sources of data on the monitoring of such rights violations. Due diligence procedures by financial institutions have largely been able to capture and screen against incidence of conditions analogous to slave labour once these are brought to the courts, but both these incidents and those of child labour are considered substantially underreported. The NGO Repórter Brasil found that as much as 60 per cent of detected slavery-like conditions may have been related to livestock production (Gomes 2021).

ILLEGALITIES OTHER THAN DEFORESTATION IN EU SUPPLY CHAINS

Illegalities unrelated directly with deforestation in Brazil that may be linked with EU supply chains include the failure to adequately inspect tainted meat or the presence of pesticide residues in foods, and the indirect effects of frontier burning, pesticide application and waste management in processing industries on air and water quality and subsequent human health effects.
4. Governmental and NGO Datasets and tools to monitor deforestation throughout supply chains

Behind the numbers and cartographic representations of deforestation are land and territorial conflicts, threats to the territorial rights of Indigenous Peoples and traditional peoples and communities. The core political issue over deforestation does not reside in satellite images. It is, above all else, about territorial rights, traditional modes of living and sociodiversity. (Various authors, Le Monde Diplomatique, 2020)

Deforestation in the Amazon has been monitored by agencies of the federal government for some time, while other regions of the country (except for the Atlantic Forest) have only recently been considered. There is a bewildering number of tools and datasets, some run by the Government and others by NGOs to monitor deforestation and wider land use. Some only focus on the Amazon, others 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. Users often must triangulate between data sources and statistics on the drivers of deforestation to comprehend the processes at work.

DATASETS

Deforestation has been monitored annually in the Brazilian Legal Amazon region by the National Institute of Space Research (INPE) through its Programme to Calculate Deforestation in the Amazon by Satellite (PRODES) using LANDSAT imagery. INPE’s PRODES datasets (issued on an annual basis for the Amazon since 1979, and biennially for the Cerrado from 1990-2012 and annually thereafter) show changes in forest vegetation from one year to the next, with the same baseline date. During the period since such monitoring began to 2019, the Brazilian Amazon was estimated to have lost approximately 718 thousand km² or 17.7 per cent of an original 4.1 million km² of primary forest.

This effort continued with more sophisticated satellite sensors, on a real time basis for immediate detection of deforestation events (DETER) to support enforcement actions in the field by federal and state government agencies. These datasets and other imagery were used to reveal pervasive forest degradation in the Amazon (DEGRAD) and occurrence of forest fires are all available for download online, providing a basis for social control. Another tool developed by INPE, called TerraClass permitted the classification of land use transitions year by year, showing the destiny of forests transformed to other uses. With a combination of these instruments, along with detection of fire points in forested areas, and implementation of command-and-control legislation along with credit restraints, it became more feasible to enforce the national Environmental Crime law (Lei dos Crimes Ambientais — Lei 9605/98) clauses against illegal suppression of native vegetation.

This command-and-control strategy paid off significantly through the government’s integrated cross-ministerial Action Plan for Control of Deforestation in the Amazon (PPCDAm) (Plano de Prevenção e Controle de Desmatamento na Amazônia), created during former president Luis Inácio (Lula) da Silva’s administration and although proposed by then Environment Minister Marina Silva, it was coordinated by the office of the Presidency (Casa Civil) from 2002-2008. From 2004 to 2012, due to a coordinated engagement of ministries responsible for the chief drivers of deforestation, annual deforestation rates in the Amazon plummeted from a peak

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12 - https://diplomatique.org.br/desmatamento-no-cerrado-e-resistencias-nos-territorios/
13 - PRODES-Amazonia: (http://www.obt.inpe.br/OBT/assuntos/programas/amazonia/prodes)
14 - O Projeto de Desenvolvimento de Sistemas de Prevenção de Incêndios Florestais e Monitoramento da Cobertura Vegetal no Cerrado Brasileiro (http://cerrado.obt.inpe.br/monitoramento-de-desmatamento-no-cerrado-brasileiro-por-satelite/)
15 - 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/).
16 - https://rainforests.mongabay.com/amazon/deforestation_calculations.html
17 - http://www.obt.inpe.br/OBT/assuntos/programas/amazonia/dester/deter
18 - 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, provided there is state capacity and political will to ground truth and inspect violations.
of 27.8 thousand to 4.6 thousand square kilometres (km²). This successful effort was widely applauded internationally, having laid the groundwork for Brazil’s National Climate Change Plan (Plano Nacional sobre as Mudança do Climático) which committed to a reduction of 80 per cent in Amazon deforestation and 40 per cent of Cerrado deforestation by 2020, consistent with the national climate change policy passed into law in 2009 (Law Nº 12.187, Dec. 29, 2009).

Despite these initial successes, legislative changes in the Forest Code in 2012 and increasing laxity in enforcement since 2015 accompanied by an economic and political crisis led to a corresponding return to growth in deforestation rates in the Amazon (Figure 5). Annual deforestation in 2019/20 was double that of 2015.

Outcries regarding vegetation loss in the Cerrado biome resulted in the development of a parallel Plan for Prevention and Control of Deforestation and Burning in the Cerrado (Plano de Prevenção e Controle do Desmatamento e Queimadas no Cerrado-PPCerrado), and similar satellite imagery was analysed to track the rate of natural vegetation loss (PRODES-Cerrado) and land use transition (TerraClass-Cerrado). By 2018, the Cerrado was estimated to have lost half of its original natural vegetation due to land use change (PRODES-Cerrado), though some estimates arrive at this figure earlier. Recent compilations of deforestation data in the Cerrado by the Laboratory for Processing of Images and Geoprocessing (LAPIG) at the Federal University of Goiás (UFGO) show that a total of 283.4 thousand km² of native vegetation was suppressed in the Cerrado in the period 2001-2019 in the 12 states which lie within the biome: the most significant being Goiás, Minas Gerais and Tocantins. The rate of deforestation in the Cerrado has declined somewhat since its peak in 2013, though continuing rapidly in the Matopiba region where much soybean expansion has been concentrated (Figure 6).

Figure 5. Annual and monthly deforestation rates in the Brazilian Amazon showing how they stabilised 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.

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Brazil’s Federal Public Prosecutor’s office (MPF) has recently created an instrument linked to PRODES called Amazonia Protege (Protect Amazonia) to detect illegal deforestation at the property level. The system cross-tabulates georeferenced data from PRODES with the CAR and INCRA registries of land holdings and regularisation (SIGEF, CIE and Terra Legal, see section 5). The system, which began to be used for environmental crime detection in 2015, sidesteps one of the major problems associated with such legal processes by remotely identifying lands which have been subject to illegal deforestation as the basis for judicial actions to catch the perpetrators of such acts on site. Businesses which buy from those sources physically identified as having engaged in illegal deforestation could then restrict purchasing from these sources.

MapBiomas (Observatório do Clima)\textsuperscript{22} at national level, and the Deforestation Alert System for Legal Amazonia (SAD-Imazon)\textsuperscript{23} are respected NGO datasets monitoring deforestation. Although they are not “official” sources, both are widely referenced as being equally or more reliable and timely sources since INPE’s PRODES data is only released one year after the fact, and under Bolsonaro is underfunded.

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 (UFG/LAPIG 2021). TerraClass-Cerrado was created by LAPIG in 2013 to systematically map land use and native vegetation coverage in the Cerrado biome, covering the period from 2013 to 2018, with support from the World Bank/GEF and in partnership with INPE and Embrapa.\textsuperscript{24} LAPIG, based in Goiânia, had pioneered geoprocessing for detection and alerts of deforestation in the Cerrado from 2005. More recently, LAPIG assumed an even more vital role in mapping of 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.\textsuperscript{25} The platform, based on INPE’s PRODES- and DETER-Cerrado databases considers visually inspected validation points, field visits and automatic analysis methods for detecting deforestation and to identify susceptibility to future deforestation pathways. The user can view a compilation of geophysical, edaphoclimatic, land tenure, land cover and infrastructure data associated with each incident of native vegetation suppression. The contextual data should enable the identification of pressures on Indigenous and traditional lands from neighbouring properties.
ALERT SYSTEMS

Imazon, a renowned research NGO focused on the Amazon, developed the SAD (Deforestation Alert System for Legal Amazonia) that provides a deforestation and degradation tracking system for the Legal Amazon which has long been the go-to source for such data when delay with the INPE figures has impeded a timely response. SAD’s alert function has been reinforced by DETER, which is able to provide real time official identification of where deforestation is found to occur.

MapBiomas also incorporates an alert system that is at higher resolution than either SAD or DETER. “The purpose of the project is to generate documentation for deforestation alerts. MapBiomas Alert is not a new deforestation alert system, but rather an effort to enhance the usability and effectiveness of alerts already generated by other systems.”

Table 1, below, describes the principal characteristics of the monitoring systems in existence, both public, official databases, NGO and academic, indicating their substantial range of resolution and purpose.

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26 - http://alertas.mapbiomas.org. “The alerts generated by DETER (Amazon and Cerrado), SAD, SipamSAR (Amazon, run by the Ministry of Defence) and GLAD (University of Maryland, USA – remote sensing of deforestation in other biomes) are collected and used as a reference to locate deforestation using daily high-resolution images (3 m² pixels). Each alert is checked and delimited more precisely; for each validated alert, where before and after deforestation images are identified, a report is prepared including cross-tabulation with the Rural Environmental Registry (CAR), Protected Areas, Rural Settlements, and other geographic categories (e.g., biomes, states, river basins), as well as the history (1985 to 2019) in the Brazilian land cover and land use maps of MapBiomas. The data produced is public and free and can be accessed on the platform.”
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<th>Frequency</th>
<th>Resolution</th>
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**Sources**: PRODES-Amazonia\(^{28}\); PRODES-Cerrado\(^{29}\); DETER-Amazonia\(^{30}\); DETER-Cerrado\(^{31}\); WRI-FORMA\(^{32}\); DEGRAD Amazônia (Assis et al., 2020); MapBiomas\(^{33}\); Imazon-SAD\(^{4}\); TerraBrasilis\(^{35}\); INPE TerraClass (Neves et al., 2020); Atlas Agropecuário\(^{36}\); Trase (2018); GTAP Bio\(^{37}\); Sipam-SAR\(^{38}\); GLAD-Global Forest Watch (GFW)\(^{39}\)

\(^{27}\) Substituted by DETER-B from 2017 onward. [http://www.obt.inpe.br/OBT/assuntos/programas/amazonia/degrad](http://www.obt.inpe.br/OBT/assuntos/programas/amazonia/degrad)


\(^{29}\) [http://terrabrasilis.dpi.inpe.br/app/dashboard/deforestation/biomes/cerrado/increments](http://terrabrasilis.dpi.inpe.br/app/dashboard/deforestation/biomes/cerrado/increments)


\(^{33}\) [https://plataforma.brasil.mapbiomas.org/](https://plataforma.brasil.mapbiomas.org/)


\(^{35}\) [http://terrabrasilis.dpi.inpe.br](http://terrabrasilis.dpi.inpe.br)

\(^{36}\) [http://atlasagropecuario.imafloira.org/](http://atlasagropecuario.imafloira.org/)


DATASETS LINKED WITH TRADE DATA

Imazon has recently assessed the direction of commodity flows in an econometric (CGE) global trade model linked with a deforestation simulation model (GTAP-BIO) to predict the potential linkages between the proposed Mercosur-EU trade agreement and future deforestation in Brazil, with a focus on the Amazon and Cerrado biomes (Imazon 2020). The study affirms that supply chain management is as yet incapable of dealing with all deforestation risks. Although tracking agricultural products and beef may enable traders to refuse goods connected with direct deforestation at the last link in the supply chain, the risk of leakage and indirect deforestation may increase through several pathways.40

As described in Section 3, Trase has linked deforested areas with trade flows, based on sourcing documentation to connect trade hubs (e.g., granaries and slaughterhouses) in municipalities where deforestation has been identified in association with crop or pasture expansion with their buyers overseas to identify the deforestation risk associated with such purchases. Trase calculates the probable risk to buyers of products shipped from one country to another using information on crop yields and animal stocking rates and forest conversion to make way for new pastures or cropland in the vicinity of the exporter. Although the municipalities from which beef or soy is obtained and the deforestation risk are accurate, the estimate of the deforestation risk associated with commodity volumes from each contributing municipality that are shipped from a specific logistic node to a specific European port is modelled probabilistically using transport optimisation algorithms. Indirect effects of knock-on deforestation from crop expansion are not estimated due to uncertainty (zu Ermgassen et al. 2020).

The AtlasAgropecuário database joins MapBiomas’ high resolution (30x30m) time series on forest cover and agricultural lands at the national level with a variety of tenure mapping sources and tools (INCRA registries, land reform properties, the CAR,41 and simulation based on other sources) enabling the Institute for Forest and Agricultural Certification and Management (Instituto de Certificação e Manejo Florestal e Agropecuário-Imaflora), a specialised environmental services and research NGO, and partners to develop the Atlas Agropecuário platform that allows the visitor to visualise property boundaries and how the land is being used by overlaying property lines and land use changes.42 These data have 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 (Vasconcelos et al. 2019) and from rural enterprises in Mato Grosso (Vasconcelos et al. 2020).

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, replacing the previously open access GFW-Commodities, which was decommissioned. GFW-Commodities was initially restricted to soy, oil palm and wood fiber data on a global level (Lujan 2019). GFW also added an alert system (FORest Monitoring for Action (FORMA)) which provides alerts at a higher resolution than DETER. This system was more recently replaced with an alert system based on RADD (Radar for Detecting Deforestation) remote sensing which can register land use change through cloud cover at a 30m pixel size.43

The Nature Conservancy (TNC) has also developed an integrated platform for business planning in the soy and beef agroindustries called Agroideal44 which includes information useful for planning the rational occupation of areas with agricultural aptitude that also pose low socioenvironmental risk.

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40 These include: i) displacement of pasture by annual cropland and increased land rents, leading to encroachment on native forests elsewhere (leakage); ii) 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 iii) deregulation of environmental and land use safeguards including Indigenous territories to permit greater production for export markets (Imazon, 2020).
41 See details of these systems in Section 5.
42 http://atlasagropecuario.im aflora.org/.
43 https://www.globalforestwatch.org/blog/data-and-research/radd-radar-alerts/
44 https://agroideal.org/en/
RURAL ENVIRONMENTAL REGISTRY

As discussed in Section 3, the Brazilian Rural Environmental Registry (CAR) was incorporated in the Oct. 2012 revisions to the national Forest Code (Law No. 12.727). The CAR provides a “license to operate” for those property owners who are deemed compliant with the law’s requirements for legal reserves and permanent protection areas, making them responsible to protect or restore native vegetation on their properties, proportionately to the overall land area, according to the biome. The relative proportions to be preserved or restored on each property under the Forest Code are as follows: between 50 and 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.

Protected areas and Indigenous lands that are legally demarcated and officialised are not subject to CAR. The presence of private CAR registries and occupations within such areas is illegal, undermining their protections and leading to land tenure conflicts with those who claim these areas as their own (see Section 5).

One of the gaps in the implementation of the CAR refers specifically to the absence of mechanisms to resolve the widespread occurrence of overlapping property rights and associated deforestation and burning in public forests, Indigenous lands, traditional territories and conservation units (Oveido et al., 2021).

Instead, the very absence of targets for the conclusion of the CAR validation and promotion of policies for the registration of territories of traditional peoples and communities (CAR PCTs segment) has stimulated illegal occupation, including that on regularised public lands. In the Legal Amazon, CAR records that overlap with regularised protected areas increased by 56 per cent in the first two years of the Bolsonaro government. Records of irregular areas in federal sustainable use protected areas grew by 274 per cent, while federal strict use protected areas registered an increase of 54 per cent in irregular occupation, and that in Indigenous lands grew by 31 per cent (Ibid. 2021).

Under the 2012 revisions in the Forest Code, each state had the option to develop its own CAR registry and to harmonise its operation with prior rural environmental licensing systems in place to monitor compliance with the Forest Code in states such as Mato Grosso, Paraná and Pará. A recent compilation of the coverage of the CAR by biome is presented in Figure 7, with a total of 6.5 million properties registered on a total of 543.7 million ha. The unified National System of Rural Environmental Registries (Sistema Nacional do Cadastro Ambiental—Rural - SICAR) monitoring system was created to join all state CAR databases at the national level. The SICAR system harmonised the disparate databases and created a unified federal mapping system under the auspices of the National Forest Service.
The 2012 revisions in the Forest Code provided considerable flexibility for landowners to use areas formerly reserved for protection, resulting in permission for a vast area to be opened to legal deforestation, particularly in the Cerrado biome, while also permitting “compensation” of deforestation in areas protected on other properties in the same biome (Brancalion et al. 2016). While the compensation clauses of the new law promised to fold many more farmers into compliance and to finance conservation by forest protecting landowners, it threatened to impoverish areas important for agricultural productivity of the essential ecosystem services provided by forest remnants, leaving them legally vulnerable to encroachment (May et al. 2016).

Tracking initiatives associated with efforts to reduce deforestation in Brazil have typically had the CAR as a point of departure, since its violation implied illegal change in land use from native vegetation to other uses. Cross-referencing of areas deforested that infringe upon the LR or APP declared in the CAR that should remain untouched, with data that trace the source of animals or crop commodities that enter market circuits from such properties has been employed effectively by slaughterhouses or grain buyers as a filter to exclude suppliers.

Figure 8 shows how different land use categories are treated in the Forest Code in the Amazon.
TRACING OF CATTLE

There are two principal tracking systems in place in Brazil to follow the movement of cattle to slaughter and final consumption. Both were devised primarily for animal sanitation purposes, to ensure that the animals had received the necessary vaccinations against hoof-and-mouth disease. Among the primary actors in cattle tracing, the Ministry of Agriculture, Livestock and Supply (Ministério de Agropecuária e Abastecimento - MAPA) is responsible for issuing cattle transport forms (GTA) to enable the tracing of eruptions of hoof-and-mouth disease and other contagions. The GTA is obligatory and is applied to lots of cattle (usually by truckload) rather than individual animals and includes the farm of origin, information on the owner and the transaction. administered through each state’s sanitary inspection apparatus.

The MAPA also administers a considerably more sophisticated voluntary System of Identification and Certification of Cattle Origin (Sistema de Identificação e Certificação da Origem de Gado-SISBOV). This tracking and certification system, also administered by MAPA, tracks individual animals whose meat is destined for export. Individual tracking is done by implantation of radio frequency identification (RFI) earrings on each animal, registering each movement to links in the supply chain. This approach was adopted at the insistence of the EU to permit Brazil to sell meat within the block, following hoof and mouth outbreaks in Brazil in the 1980s. SISBOV only certifies ranches as “apt” to export if they conform with SISBOV’s sanitary guidelines, which is currently the case in only nine of Brazil’s 25 states.49 However, 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 list.49 Nevertheless, recent research by the Gibbs Lab at University of Wisconsin showed that even SISBOV does not provide sufficient traceability to ensure that beef from these farms is not contaminated by deforestation from indirect suppliers.51

Most of the beef exported by Brazil does not fall under SISBOV but must be subject to federal inspection at the slaughterhouse of origin according to the Federal System of Inspection (Sistema de Inspeção Federal-SIF). The major beef packers now link the SIF barcode to the ranch which is the direct source of the animals registered, enabling consumers or traders to track where their meat comes from. Neither the GTA nor SISBOV contain information on the environmental status of the farm of origin but are increasingly being used for monitoring of the origin of cattle.

Due to judicial requirements imposed by the MPF of Pará through the so-called “Term of Conduct Adjustment (Termo de Ajuste de Conduta-TAC dos Frigoríficos)” in response to growing deforestation for pasture expansion, as of 2009, the major Brazilian beefpackers (including JBS, Marfrig and Minerva) made public commitments to implement tracing systems identifying the origin of the cattle they process for market. Subsequently other slaughterhouses also signed such agreements. The cattle cycle in Brazil typically includes three stages: cow-calf, stocker, and feedlot, it being possible to combine two or all three stages in integrated operations. However, though the TAC required that such tracing reach back to the origin of the calves, over the first seven years of the TAC’s implementation, the companies were found not to have gone beyond the first tier of properties which directly deliver animals to slaughter or finish in the slaughterhouse’s holding feedlots, therefore not including indirect suppliers who typically represent a principal source (over 40 per cent) of deforestation in the chain (Barreto et al. 2017).52

Another serious problem with cattle monitoring relates to “cattle laundering” or “triangulation”, in which animals raised in areas interdicted due to deforestation that would be detected by buyers with monitoring systems in place are moved to ranches which have not been so interdicted for final fattening prior to transfer to the slaughterhouse to “clean” the supply chain. Such transfers may only be on paper “to enable cattle sales by masking its real source” (Campos and Locatelli 2021).

49 - 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).
52 - “…the pasture area in Brazil has been relatively stable since 2005, at approximately 180 Mha. Cropland, in particular soy and sugar cane, expanded by 19.2 Mha between 2005 and 2017, with most of the expansion occurring on pasture, which, in turn, has expanded into forest. JBS, Minerva and Marfrig carry considerable deforestation risk also because of the limited geographical scope of their commitment (to avoid purchasing from lands deforested since 2009): 47.1 per cent of these companies’ deforestation risk arose from sourcing cattle in the Cerrado, where the G4 does not apply, and 17.2 per cent of their deforestation risk stemmed from sourcing cattle outside the Legal Amazon, where TACs are not in place.” (zu Ermgassen et al. 2020).
Conceptually, at least, it should therefore be possible for MAPA to coordinate the monitoring of ranches contaminated by deforestation by cross-referencing those which are noncompliant with the CAR with their corresponding GTAs, thus enabling slaughterhouses to refuse such suppliers. However, JBS, siding with critics at MAPA and others in the industry, argues that the GTA contains information on producers that is protected by privacy law and their identities should therefore be masked in the database to enable animals to be traced back to their origin without breach of privacy. Adoption of an electronic GTA system, that has been proposed to facilitate tracing could easily provide for encryption of producers’ identities for this purpose while still ensuring the possibility of cross-referencing with environmental diligence data.

With the livestock sustainability agreements created under the 2009 TAC, the MPF aimed to identify illegal areas, rather than the names of the offenders, because the use of “laranjas” (stooges) is a consecrated practice by gangs involved in “laundering” cattle. In this sense, an instrument that should be expanded at the federal level is the List of Illegal Deforestation (LDI), already created by the Pará government. The list prohibits the granting of licenses, authorisations, services or any other type of benefit or public incentive to undertakings and activities located in illegally deforested areas and is the official consultation tool in the territory of Pará. The linking of the electronic GTA to the CAR will also hamper these frauds, as they will allow for verification by locale of origin of the animals, and not by the CAR holder (Torres et al, 2017). Fraudulent records in the CAR database could also be revealed in this way (see Section 5).

The major meatpackers have different strategies for responding to the fact that they have so far been incapable of honouring the requirements of the TAC as regards indirect suppliers; JBS, the largest of the three, has signed a Protocol of Guaranteed and Verified Origin, with the National Agricultural Confederation (CNA), representing cattle ranchers. The protocol would phase-in traceability back to the origin of indirect producers using the CNA’s Agricultural Management Platform (PGA – a database of producers by tax identification number) and would cross-tabulate those data with compliance registries such as the CAR to first identify and then provide technical and financial assistance to bring these producers into compliance. These data would be made available to the market starting in 2022.

Marfrig, in contrast, has developed its own major ten-year plan called the Green+ Plan (Plano Verde+) committing to integrate its supply chain with a broader landscape approach in partnership with the Sustainable Trade Initiative (IDH) and the state government of Mato Grosso, driven by efforts to improve smallholder and traditional communities’ production systems through financing and technical assistance and to upgrade the traceability of the supply chain overall. This jurisdiction specific initiative began in select subregions of Mato Grosso in league with the state’s Produce, Conserve, Include (PCI) programme, based on similar landscape principles, and is expected to expand to southern Pará.

These and other corporate initiatives have benefitted substantially from cooperation with NGOs that have been active in monitoring the TAC since 2009, and that have recommended approaches to fold indirect producers into tracing systems on the ground. Among leading players in this endeavour, the National Wildlife Federation (NWF) collaborates with the Gibbs Lab at the University of Wisconsin to provide access and training to meatpackers to operate its Visipec tracing freeware (see Box 1), and with Amigos da Terra- Amazônia Brasileira which leads a Working Group on Indirect Suppliers (GTFI). The GTFI has promoted a pact to bring such suppliers into compliance with the CAR and other socioenvironmental indicators, whereby indirect suppliers are charged with identifying at least one upstream supplier.
Another important development is the establishment of a Protocol for Monitoring of Cattle Suppliers, led by the MPF and the NGO Imaflora, which aims to guide slaughterhouses seeking to comply with their zero deforestation purchase policies.

A significant number of private geoprocessing and big data analysts have also joined with 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 Box 1).

**BOX 1. CATTLE TRACKING INITIATIVES IN BRAZIL**

### AgriTrace
Technology launched by the CNA with the support of Brazilian Beef Exporters Association (ABIEC); provides animal traceability through a unified computerised system that brings together the traceability protocols. ([https://www.cnabrasil.org.br/agritrace](https://www.cnabrasil.org.br/agritrace))

### Agrotools
Geographical platform, this tool allows large companies to track suppliers and customers throughout a rural territory, permitting identification of the locations of rural properties that give rise to the products consumed and to verify the type of social and environmental risk, such as deforestation, slave labour, Indigenous lands, embargoed areas, conservation units, and other criteria. ([http://Agrotools.com.br](http://Agrotools.com.br))

### Boi na Linha Project (Imaflora)
A platform for transparency of the beef value chain that seeks to strengthen the social and environmental commitments of the beef production sector; seeks cooperation with the meatpacking companies, prosecutors, NGOs and retailers in improving the technical criteria and instruments for monitoring and verifying commitments adopted by the sector. ([https://www.boinalinha.org/informacao](https://www.boinalinha.org/informacao))

### NicePlanet
Supports the selection of cattle-supplying farms that meet the TAC and other legal commitments. The service issues reports and information for real-time audits and analyses the meeting of social and environmental criteria of purchases made by the industry. ([http://Niceplanet.com.br](http://Niceplanet.com.br))

### ProForest
Supply chain mapping, a project of the Good Growth Partnership (supported by UNEP, WWF, Norad, GEF, McDonalds Corp. and CDP), assisting purchasers of leather and meat products in engaging with their suppliers; providing technical support, helps companies develop and implement responsible purchasing policies and guidelines; seeking to integrate the monitoring system with traceability systems. ([https://www.beeftoolkit.net/](https://www.beeftoolkit.net/))

### SafeTrace
Identify an item individually (e.g., a bull) or batch aggregate; all quality and handling data are linked to its identification; each new move, farms/companies are checked for social and environmental criteria; Good practices for animal welfare and production are required and verified in the selection of suppliers who adhere to the Safe Trace traceability seal; all information provided by producers is periodically audited. ([http://www.safetrace.com.br/st2010/Pagina.do?idSecao=32](http://www.safetrace.com.br/st2010/Pagina.do?idSecao=32))

### Visipec
Traceability tool developed by Gibbs Lab in cooperation with NWF, works in conjunction with the existing monitoring systems used by Brazilian meatpacking companies; the objective is to improve visibility along the supply chain of the cattle sector and to establish more effective deforestation monitoring; the tool integrates information from public databases and serves to complement existing systems to help reduce the risk of exposure to deforestation of meatpacking companies from indirect suppliers. ([https://www.visipec.com/](https://www.visipec.com/))

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55 - Part of the data shown in this box were derived from (Agrosuisse Ltda. 2020).
TRACING OF SOYBEANS:
Soybeans thrive on the flat cerrado terrain which facilitates large-scale mechanisation. Farmers began growing soybeans there in the 1970s, adopting no-till cultivation as a cheaper and more efficient technique that also protected the soils, retained water and provided more organic matter in the straw remaining after each harvest, allowing continuous cultivation.

Nevertheless, no-till cultivation requires greater and more frequent applications of agrochemicals whose efficacy has declined over time, challenging the productivity of GMO “roundup-ready” soybeans that have become dominant in Brazil. The EU now permits imports of GMO soybeans but not its cultivation within the block, and demand for non-GMO imports is increasing. Separate tracing of different trade streams has been found to be a significant challenge in the industry.

Tracing of soybeans is commonly done in lots or truckloads, which must carry transport bills of lading and fiscal receipts which identify the source of the goods being shipped and the characteristics of the product. Grain silos are usually then identified as the source for onward tracing, performed in soybean tracing by Trase, for example.

In order to reduce deforestation rates and meet the demands of external market actors increasingly concerned that soy was advancing into the Amazon frontier, the Soy Moratorium, a voluntary zero-deforestation pact, was initiated in July 2006 with engagement of traders, government and NGOs. Through this agreement, the Brazilian Association of Vegetable Oils Industries (ABIOVE) and the Brazilian Association of Cereal Exporters (ANEC) — which include the principal global grain trading companies such as Amaggi, Louis Dreyfuss Corp. (LDC), Archer-Midland-Daniels (AMD) and Cargill—committed themselves to avoid the marketing or financing of soy produced in areas that have been deforested in the Amazon biome after that date (Heilmayr et al. 2020).

There has been a significant decline in direct soy-related deforestation in areas subject to monitoring under the Moratorium. According to its most recent report (ABIOVE 2019), deforestation was drastically reduced in the 95 municipalities monitored in the Amazon biome (Figure 9). Looking only at the portion of the Amazon in which 97 per cent of soy is grown (89 municipalities with more than 5,000 ha of soy each), only 5.8 per cent of the new soy area during the period in which the Moratorium has been in effect was in lands deforested during this period. Many of those municipalities targeted in the Moratorium were among those that had been embargoed by the Ministry of the Environment as the most severe sources of deforestation in the Amazon region, subject to credit restrictions and fiscal restraints; thus, a mix of policies were successfully applied to depress deforestation rates. Despite this policy overlap that affected deforestation rates, the partners engaged in monitoring of the Moratorium contend that the effectiveness of mechanisms to combat deforestation in the Amazon was greater in those municipalities subject to the Moratorium than it was in other municipalities subject to similar command-and-control strategies exerted over much of the same period (ABIOVE 2019: p. 9).
Nevertheless, deforestation for soy cultivation in areas in disobedience with the Moratorium increased 23 per cent from the prior year during the 2018/19 harvest, along with the overall relaxation in command-and-control actions, leading NGOs to express concern.\textsuperscript{56}

While the Moratorium was effective in reducing deforestation for soy in the Amazon biome, the annual rate of soy expansion in both previously deforested areas of the Amazon and in the Cerrado, where the Moratorium does not apply, remained sizeable. Since the beginning of the Moratorium, the area planted with soy in the Amazon biome has more than tripled, from 1.14 million ha (Mha), in the 2006/07 harvest, to 4.7 Mha in the 2017/18 harvest, which corresponds to 13.3 per cent of the 35.1 Mha of national territory occupied with soy (ABIOVE 2019). Although they are not directly associated with deforestation, soy occupation in these areas may imply the transfer of their impacts to other areas, since many areas occupied by soy were previously in pasture. Cattle herds displaced by soy expansion may be transferred to new pastures within the same biome, so contributing to additional deforestation there. However, recent econometric studies point to greater intensification as a result of such displacement rather than further deforestation in the Amazon itself (le Polain de Waroux et al. 2019). The upshot is that it is difficult enough to trace the direct relationship between soy planting and deforestation, let alone attempt to identify indirect effects.

Efforts were initially made by some agribusiness interests to terminate the effects of the Moratorium in the Amazon after 2016 given its success over > 15 years (Gibbs et al. 2015), and some traders, notably Cargill later sought to avoid adoption of a similar zero-deforestation agreement for the Cerrado.\textsuperscript{57} Although the Soy Moratorium has been extended indefinitely in the Amazon, a parallel Cerrado Moratorium has not materialised due to resistance from farmers and traders. There is now broader agreement among actors in the soy supply chain on the need for a zero-deforestation stance in both biomes (IPAM, personal communication), and a Manifesto in favour of such a policy has been signed by a growing number of companies.

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\textsuperscript{56} - https://valor.globo.com/agronegocios/noticia/2020/06/16/cresce-area-que-desrespeita-moratoria-da-soja.ghtml
\textsuperscript{57} - According to a Bloomberg report in late 2020: “Companies represented by ABIOVE, Brazil’s soy processors group, refuse an abrupt cut-off date for zero deforestation in Cerrado as proposed since it may harm farmers who are complying with Brazilian law, according to ABIOVE’s head Andre Nassar. ‘We understand that Europe doesn’t want to buy soybeans from deforested areas, but we need to give a chance to producers to adapt themselves to it,’ Nassar said...’” (Buckley, de Sousa, and Freitas 2020)
DATA AND TOOLS TO ENSURE PROPER MONITORING THAT ARE MISSING

One of the most important sources of risk in both 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 Imaflora and partners to provide such mapping in its Atlas Agropecuário. Similar cross-referencing of the CAR with deforestation and other themes are provided in several other NGO, governmental and academic platforms, such as INPE’s Terrabrasilsis, Observatório do Clima’s (OC’s) MapBiomas, TNC’s AgroIdeal, etc. Although CAR coverage extends to a substantial proportion of land holdings in Brazil, totalling over 6.5 million properties, of which more than 2.1 million in the Amazon and Cerrado, the CAR is still an imperfect instrument. The problems include inaccuracy and potential for its use to facilitate land grabbing, due to its being self-declaratory, with considerable overlap between declared properties, as well as many declared properties overlapping with public protected areas, Indigenous territories, and traditional communities’ lands.

There is also risk of deforestation in properties declared in the CAR system that lie in public undesignated lands (terras devolutas), where clearing would denote another means of designating property rights that could then be titled under the national land regularisation programme (see section 5).

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 exploitation of mineral resources and to forced labour conditions.

Concern with the recent surge in forest fires led INPE to investigate how this relates to CAR registry. The research crossed 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 1/3 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 use of fire to open new cropland or pasture. Another 1/3 of fire points were sighted in small farms, indicating that the opening of additional forest to production is ongoing in settlements and spontaneous colonisation areas.

It should be noted here that although there are relative benefits of a municipality-level (or “landscape”) scale as adopted by Trase as the basis for estimates of deforestation risk, rather than a focus on direct or indirect supplier properties for tracing deforestation, the latter is necessary to filter out suppliers who are not in compliance with the Forest Code, a requirement for compliance with the TAC (NWF, personal communication). 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 some Amazon municipalities (e.g., São Félix do Xingú-SFX, that is nearly three times the size of Belgium!). In relation to beef, it should be cautioned however, that not all indirect suppliers are necessarily from the same municipality or microregion where the logistics hub taken as the source by Trase is located, and in fact may be moved between municipalities to “launder” them for slaughter as has been documented in SFX which is home to two of the largest cattle ranches in Brazil (Gebara et al. 2019).

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IS NATIONAL LEGISLATION ADEQUATE TO MITIGATE DEFORESTATION?

Although Brazil is known as a model for its progressive environmental legislation, without adequate personnel and enforcement capability, no legal framework will be sufficient to reduce deforestation. The significant reduction in deforestation that occurred between 2005 and 2012 was possible due to a combination of police power and interlocking credit and regulatory embargoes on “priority municipalities” that had the highest rates of increase in deforestation and the largest areas deforested. Properties out of compliance were also embargoed and had their credit access cut off after an extraordinary National Monetary Council ruling (Resolution 3545, Feb. 2008). Encouragingly, after the embargoes were later lifted, econometric studies found that those municipalities which had faced restrictions had increased their agricultural production, primarily through intensification, using their own or private credit resources (Assunção et al. 2020). It is thus clear that financial instruments must be part of any long-term solution to deforestation and improvement in production practices in the region.

What is treated as “illegal” vs. “legal” deforestation under the revised Forest Code is a confounding factor in this discussion. Under the law, landowners are permitted to clear up to the maximum allowed under the Forest Code: 20 per cent in the Amazon, 65 per cent in Cerrado areas of the Legal Amazon and 80 per cent in the Cerrado outside of Amazonia (landowners can clear up to 50 per cent in areas of the Amazon where an Ecological-Economic Zoning plan has been drawn-up and passed into state law). Additional clearing over these limits is “illegal” and subject to prosecution, fine and/or imprisonment under the Environmental Crimes statute (Law No. 9.605/1998). Nevertheless, only a very small proportion of such cases are ever tried, and fines are even less frequently paid, in part due to the sluggishness of the judicial system in Brazil.

Part of the revisions in the Forest Code allowed for consolidation of existing cleared areas, and opened up more forest areas to the axe, allowing there to be substantial “hot air” in the system (Soares-Filho et al. 2014). Thousands of km² can now be legally deforested in the Amazon and even more in the Cerrado. And although the CAR has achieved nearly complete coverage in both biomes for monitoring purposes, the Plan for Environmental Restoration (Plano de Restauração Ambiental-PRA) instruments that would require landowners to restore degraded “deficit” forestlands beyond what the code allows are still in limbo due to lack of regulatory definition at the federal level. (It is encouraging that some states have taken it upon themselves to implement the PRA provisions.)

Resolution 3545 determined that eligibility for accessing rural credit should be conditioned on legal titling requirements as well as on documentation attesting to the environmental regularity of the establishment.
A legal proposal for creation of a national requirement for cattle to be identified through transparency of both CAR and GTA databases was submitted by Deputy Zé Silva (José Silva Soares, a member of the Solidarity Party in Minas Gerais) in September 2020. The proposed Law No. 4734/20 would create a Selo Agro Verde (Green Agri-Seal), in the form of a certificate conceded to products that originate in properties that protect the environment. The proposal would amend the national Agricultural Policy bill. The proposed measure was formulated in response to domestic and international market demands for suppliers to demonstrate their compliance with socio-environmental norms, principally those associated with illegal deforestation.

A bill based on this proposal was presented in early 2021 to the national Chamber of Deputies and has been transmitted to the relevant committees for consideration. The prospects for its passage into law will depend on concrete expressions of demand from the market, in the form of EU legislation, for example.

To be certified under the Green Agri Seal, the proposed law would require that producers:

1) Attest regularisation of their property titles by INCRA;

2) Demonstrate environmental compliance using data from the CAR, and certification of having no pending environmental fines or embargos from the National System of the Environment (SISNAMA); and

3) Offer transparency of origin of agricultural products, including the origin, vigilance, and sanitary security of vegetal and animal products (i.e., GTA or SISBOV).

The law would specifically require that landowners provide data on the CAR, annual record from INPE of vegetation suppression and the existence of environmental fines or embargos, as well as providing a listing of the registry numbers in the CAR of properties from which animals were transferred (i.e., a chain of animal custody to enable tracking of indirect suppliers). Further regulatory provisions are called for to specify the documentation required.

Also under development, according to Rajão, is a geographically explicit platform (developed by staff of the Federal University of Minas Gerais (UFMG) with support from the Climate and Land Use Alliance—(CLUA) that will permit buyers to access data to identify those lots of beef that were transported from deforested areas, considering the chain of custody of the animals transported to their final destination. (As mentioned previously, each lot of beef is identified by the major slaughterhouses on their websites, as to the property of direct origin, for consumer transparency).

Such a Green Label scheme began to be implemented in early 2021 in the Amazon state of Pará, which has developed tools for cross-checking of CAR and GTA data with the technical assistance of UFMG. The system is already under fire from ranching interests, concerned that those farms identified as having forest deficit areas would be excluded from the market by public labelling. An agreement to limit access to such data to the government and the ranchers themselves has been proposed.

It may take more than freeware for the green label system to become broadly accepted by the industry, but the transparency of a public system would be more attractive to government regulators and importing countries.

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63 - According to Raoni Rajão (interview 24/02/21), the legislative strategy represents one part of a three-pronged strategy that also involves the engagement of the MPF as a means to comply with the TAC-Frigoríficos in force since 2009 in the Legal Amazon. Through the MPF 4th Chamber (responsible for the environment), the Amazon states would then be required to furnish access to the data needed to enable the crossing of GTA and CAR databases. (Note that this approach would not initially extend to the Cerrado, which is outside the reach of the TAC.) It is hoped that with the involvement already secured from the state government of Pará to provide such information, the remaining Amazon states will fall into line.

Rajão et al. (2020) provide mean proportions of animals that have been contaminated in that way for the two most significant beef and soy producing states (Mato Grosso and Pará). A reliable means for tracing farm by farm on the ground, to provide information for procurement decisions by traders is also needed. The major beef packers and supermarket chains have sunk capital into devising their own systems for traceability, which are closed to public scrutiny. The question is then what kind of information can be provided to buyers on the relative risks associated with data on individual farms, and how this can best be aggregated using the tools at the disposal of agents in the supply chain.
5. Monitoring land tenure violations by agricultural and cattle farms in Brazil

LEGAL SITUATION OF LAND TENURE AND CUSTOMARY PROPERTY RIGHTS

The 1988 Federal Constitution of Brazil provides the right of individuals to hold and alienate property, as well as confirming the social function of land. These functions include support for the welfare of owners and workers, productive land use, conservation of natural resources, and compliance with labour laws. Large properties that do not meet these criteria may be expropriated for agrarian reform. Rights of Indigenous Peoples and customary users are also assured by the constitution.

But conflicts of usufruct rights of native peoples are rife in contested frontiers at the agropastoral frontier. Indigenous and traditional communities are guaranteed legitimate property rights over their territories by the 1988 Constitution, through demarcation of Indigenous lands and granting title to Quilombolas. Since that time, 67.3 per cent of lands claimed by Indigenous groups have been fully demarcated and homologated, but some 237 territories on nearly 10.5 million ha are still not regularised.

Meanwhile, only 136 or 7.1 per cent of the Quilombolas’ rights to the 1,916 properties where their residents are demanding legal recognition have been officially titled.

Lack of titling and demarcation opens the door to incursion, often violent, for agriculture, timber extraction and mining. The Bolsonaro administration has declared that it will not demarcate any further Indigenous territories during its mandate and is reviewing earlier demarcations, having transferred the demarcation responsibilities from the Ministry of Justice to MAPA.

According to the Brazilian Forest Service — SFB, much of the land (30.6 per cent) remaining under forest in Brazil lies on public lands, of which 21 per cent are neither registered nor delimited (terras devolutas or unallocated public forests) and are thus vulnerable to occupation as a means of taking possession. The Land Statute of 1964 permitted occupants to obtain title if they could inhabit plots of public land for a continuous period of ten years without contestation for their household subsistence. The same statute also created INCRA which was charged with issuing titles within the National System of Rural Registry (SNCR), as well as carrying out colonisation and land reform projects.

Since the Law of Public Record of 1973 which regulates land registration does not require that notaries confirm their precise location, and state agencies have notoriously incomplete and overlapping records, properties are primarily self-reported. Although landowners over 250 ha were required by a 2001 law to provide georeferenced maps by 2013, only in 2014 did INCRA pilot a system so that rural notaries georeference property registries (System of Land Management-SIGEF).

The often-ambiguous status of occupation of public lands has been both a mechanism for colonisation of frontiers and for the usurpation of public lands. Land tenure regularisation that occurs in such cases may imply the fabrication of fraudulent titles and their registry (grilagem). Deforestation occurs on such properties as a means of acquiring a foothold whether for production or speculation. Land regularisation is also necessary to access credit and other public resources. State land laws have facilitated the privatisation of public lands by removing the demand that titles show the entire chain of dominion.

65 - https://pib.socioambiental.org/pt/Situa%C3%A7%C3%A3o_jur%C3%ADdica_das_TIs_no_Brasil_hoje
66 - https://cpisp.org.br/direitosquilombolas/observatorio-terras-quilombolas/
67 - The georeferencing of rural properties is supported by Article 176, §3, of the Public Records Law (Law No. 6,015/73), which regulates the cases in which the tool is mandatory, which refer to dismemberment, division in parcels or rejoining properties.
Brazilian agribusiness was favoured by the financial crisis of 2009, since it triggered a strong growth of foreign investments in the sector, either in the production of food and agrofuels, whose prices have risen, or because in times of crisis land is seen as a reserve of value, accelerating the phenomenon of «financialisation of agriculture». This, in turn, determines the intense dispute over land in the Brazilian countryside, often through violent methods against the most disadvantaged, such as Indigenous communities and traditional populations (Alentejano 2020). Land values in the Matopiba region experienced accentuated increases from 2003 and 2019 owing to intense pressure for agribusiness expansion; according to recent studies the land price increase averaged 390 per cent among land transactions surveyed over the 16-year period (Kato and Leite 2020).

Successive administrations have grappled with the problem of legitimising land rights derived by occupation. The most recent attempt in this direction, begun in 2009 under the Lula administration, is called “Terra Legal”. The statute permits titling of land occupied since before 2004 on federal public land in the Amazon region by self-declaration. As a basis for granting title, the programme undertook a massive effort to georeference and to destine the use of public lands to avoid overlaps with protected areas and Indigenous territories, reviewed by a technical board. Nearly 35 million ha were regularised for private use by 2015, while an additional 13 million ha were dedicated to protection or Indigenous lands (Damasceno, Chiavari, and Leme Lopes 2017). However, the title’s selective implementation grants preference to large land holders, rather than to smallholders or traditional populations (Probst et al. 2020). Titled land claims under the programme may be as large as 1,500 ha, though smaller occupants were not obliged to pay for their titles.

In effect, the Law which created Terra Legal in 2009 legalised land grabbing since it did not distinguish between squatters (posseiros) and land grabbers (grileiros) in the titling process. The bill legitimised land regularisation for these who conduct «indirect exploitation”, which means economic activity exercised in rural property, by means of an agent or wage earner. Thus, the “grileiro” was equated to the squatter, because, in general, the grileiro does not directly occupy the land, but uses agents, or «laranjas» to do so.

Article 231 of the Brazilian Constitution of 1988 recognises the inalienable right of Indigenous Peoples to lands they «traditionally occupy» and automatically confers them permanent possession of these lands. In practice, however, a formal multi-stage process of demarcation initiated by the National Indian Foundation (FUNAI) is required for Indigenous lands to gain full protection.** This has often entailed protracted legal battles, during which time the lands often fall prey to incursion. In the case of Indigenous territories, although usufruct rights are granted in perpetuity, they remain the property of the Union. As regards Quilombo territories, once legitimised by the federal government, property title is granted on a collective basis. Similar to Indigenous rights, the rights of Quilombolas are subject to protracted dispute.

Other collective land rights exist in different parts of Brazil. For example, large areas of the Cerrado in Minas Gerais and southern Bahia are termed Gerais or common property territories that traditionally have been used by traditional communities for extensive grazing. Occupied by geraizeiros as the local peoples are known, use rights to such areas have been particularly threatened by the expansion of commodity production in the Cerrado. Traditional community status was granted to 73 communities of geraizeiros in part of Minas Gerais in 2018, having secured the Certificate of Self-Determination provided for in state law. Yet such recognition does not provide a guarantee of protection against dispute.
There is a general lack of clarity with respect to how the Forest Code applies to cases of collective property and land occupation (Damasceno, Chiavari, and Leme Lopes 2017). The employment of CAR registration is also perceived to offer a foot in the door to land titling, which occurs due to its being possible for occupants to self-declare those properties for the purpose of CAR registry. 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 (Azevedo-Ramos et al., 2020).

Recent efforts to undermine Indigenous territorial claims that are still in process of demarcation would endanger protections to Indigenous land rights that are constitutionally established. Inquiries by the Federal Public Prosecutor’s office in mid-2020 identified the overlap of nearly 10 thousand CAR registries in areas designated as Indigenous territories or that have use restrictions due to the presence of isolated Indigenous groups. The response has been to void these registries, but the threat persists. More than 29.7 million hectares in irregular CAR overlapping with protected areas (both Indigenous lands and conservation units) have not yet been cancelled, which encourages land grabbing and deforestation in these territories.

Studies by IPAM suggest that in 10 Indigenous areas where such overlaps exist there is a concentration of deforestation and fire points sighted in INPE databases. The study concluded that further CAR registries should be suspended to avoid additional loss in forest cover within Indigenous areas (Fellows et al. 2021).

**MONITORING OF LAND TENURE CONFLICTS**

Several public, academic and NGO databases have been developed to monitor incursions in Indigenous and traditional territories, serving as a basis for civil society or judicial action to enforce rights.

INCRA’s national public database of certified properties informs the existence of 116.6 million ha in Indigenous Areas, and 2.9 million ha in Quilombo territories. An additional 31.6 million ha are characterised as “Recognised Areas”, which include sustainable use areas such as RESEX, Fundo de Pasto, RDS, as well as state and municipal land reform projects. These areas combined make up 15 per cent of all land areas certified in the INCRA database. Property certification provides some measure of protection but may be contested. The current efforts by the federal government to provide greater flexibility in access and use of Indigenous areas represents a serious breach of protections. Since those 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 and homologation of Indigenous areas can help to reduce deforestation rates (Baragwanath and Bayi 2020).

The MPF does not possess its own capabilities to monitor land use change or incursions but has obtained professional support to carry out the crossing of Indigenous territories with CAR registries, as described above. The MPF responds primarily to denunciation and may launch judicial action on behalf of Indigenous groups.

Monitoring of Indigenous territories threatened by incursion is increasingly left in the hands of Indigenous groups themselves, especially as the presence of FUNAI has become less evident with a decline in resources and discontinuity in the demarcation and homologation process. ISA has maintained a complete record of Indigenous lands in the various stages of demarcation, as well as registered the overlap between Indigenous territories and protected areas. The Protected Areas Monitoring Programme monitors the legal and demographic situation, government projects, environmental characteristics and enterprises that affect the integrity of Indigenous lands and protected areas.

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The ISA Protected Areas Monitoring Programme has additionally developed a database that contains georeferenced data for 361 Indigenous territories in the Legal Amazon up to 2017. The database system, called Terras+ includes a weighting of concerns in the form of a spider’s web graphic for each territory including indices for: legal stability, environmental integrity, environmental integrity in the buffer zone surrounding Indigenous lands, territorial integrity, an absence of threats due to infrastructure projects, an absence of pressure from infrastructure projects, and governance.

The development of these indicators took into account the availability, effectiveness and reliability of secondary data that could depict the general characteristics of the territory, environmental and governance situation of each Indigenous territory as to the degree of institutional, legal and socio-environmental stability. Although the database includes details on territorial integrity associated with incursions and land use change in the surrounding areas, it does not appear to have a specific emphasis on the presence or absence of agricultural activities.

The most substantial body of data on rural land conflict informed in Brazil as a whole is organised by the Centre for Documentation of the Pastoral Land Commission (CPT), whose state and regional offices and links to local parochial branches permit a vast network of communities and supporters. The CPT was created in June 1975, during a Meeting of Bishops and Prelates of the Amazon, convened by the National Conference of Bishops of Brazil (CNBB), held in Goiânia, Goiás. It was founded during the military dictatorship, as a response to the serious situation experienced by rural workers, migrant and daily labourers, squatters, and peasants, especially in the Amazon, exploited as slaves or expelled from the lands they occupied, but quickly spread throughout the country, following the demonstrations and occupations in favour of Agrarian Reform, mainly those by the Landless Movement (MST and similarly minded organisations of the landless).

Because the Amazon concentrates a large part of the conflicts and violence in the countryside, in 2009 the CPT decided to create a means to coordinate the CPTs that operate in the nine states of the Legal Amazon, in addition to being part of the Pan-Amazonian Ecclesial Network (REPAM). In 2012, it was the turn of the CPT Regional offices operating in the Cerrado to create a similar means of coordination, culminating with the launch of the “Campaign in Defence of the Cerrado”, in 2016. The campaign has the objective of making society aware of the need to protect the Cerrado from the impacts of large agribusiness, mining, and infrastructure projects, valuing its socio-biodiversity and preserving the biome, considered the great water reservoir of the country the biome represents, as its rivers supply six of the eight largest Brazilian hydrographic basins, in addition to the entire Pantanal.

In 1985, the CPT data began to be systematised and published in the annual report “Conflicts in the Brazilian Countryside”, which records conflicts over land and the statistics of violence against people, such as murders, death threats, arrests, etc. Among the Observatory’s sources are the unemployment insurance system for rescued workers and the Slave Work Eradication Control System (COETE), Social IpeaDATA of the Applied Economic Research Institute (IPEA), the National Household Sample Survey (PNAD) of the Brazilian Institute of Geography and Statistics (IBGE) and the Agricultural Census, also from IBGE.

In 2018, the database was restructured, joining the two previous databases into the DataCPT Database of Conflicts in the Countryside. With this effort, the CPT has become the only entity to carry out such extensive research on the agrarian question at a national scale, and its data is used by various educational institutions, researchers, government agencies and the media. According to the latest report, published in 2019, 60 per cent of land conflicts in Brazil took place in the Amazon, which also concentrated acts of extreme violence, with 27 (84.4 per cent) of the 32 murders recorded.

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71 Brazilian law does not provide for buffer zones around Indigenous territories as it does with other protected areas, but some Indigenous groups have been able to declare such areas as buffers.
72 https://terrasmais.eco.br/v1/about/?lang=en
73 Bahia, Piauí, Mato Grosso, Mato Grosso do Sul, Goiás, Minas Gerais, Maranhão, Tocantins and Rondônia.
Unfortunately, however, the CPT data are largely descriptive, providing municipality and place names or the name of landowners and the number of families engaged in the dispute and area involved in some cases, but are not georeferenced so as to permit crossing with land use data or CAR registries. It would however allow importers to flag sources by municipality to ascertain whether land conflicts are associated with their product. CPT also regularly tallies land occupations and expulsions, rural violence and deaths connected with land conflicts, as well as conflicts over water resources. Recent thematic campaigns have addressed health problems in rural communities and workers associated with agrochemical use in large scale commodity production.

Scholars at the Graduate Program in Social Sciences in Development, Agriculture and Society of the Federal University of Rio de Janeiro (CPDA/UFRRJ) have been monitoring foreign investments in land (land-grabbing by non-Brazilian investors). Specific cases have paradoxically involved major institutional investors such as educational pension funds and university endowments in the US and Canada. The monitoring tactic employed is to “follow the money”, to trace acquisition of major land tracts in western Bahia destined to crop production or ranching, in some cases involving land grabbing from traditional community members and falsification of titles to enable them to legitimate claims to substantial areas thereafter transformed to crop production through deforestation (Kato and Furtado 2020).

Legal support to traditional communities to combat such practices has been provided by pro bono groups such as the Association of Lawyers for Rural Workers of Bahia (AATR) in cooperation with the MPF. There is a clear connection with emerging government policy to open land purchase to foreigners, permitted as of 2020 in certain cases. The AATR in collaboration with the National Campaign in Defence of the Cerrado, recently published an analysis of land tenure and environmental legislation affecting the Matopiba region and its land disputes (AATR 2020). Reacting to the perception that the region represents an unpopulated open frontier, the report asserts the existence of hundreds of traditional communities under threat from land grabbing.

**MONITORING OF LAND TENURE CONFLICTS ASSOCIATED WITH DEFORESTATION**

INPE provides a means to overlay CAR registries with deforestation, as well as Indigenous and protected areas in the Amazon and Cerrado regions at its TerraBrasilis dashboard. INPE’s BDQueimadas database available at the same portal also crosses heat points sensed 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. The system provides access to fire points imagery obtained from Nasa satellites.

In principle, these 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 on the surrounds. INPE’s TerraClass research project carried out an analysis of land use transition in the Legal Amazon jointly with Embrapa between 2004 and 2014, but the project was then discontinued, having provided important information on the process of land use transformation in the Brazilian Amazon, a technique used by the proponents of the Soybean Moratorium to certify the near absence of direct deforestation in the value chain.

Other academic centres which have been instrumental in geographically explicit analysis of the interactions between land use, tenure and the Forest Code include the Laboratory of Ecosystem Services Management jointly managed by professors Britaldo Soares-Filho and Raoni Rajão at the Federal University of Minas Gerais (UFMG) in Belo Horizonte, and the geoprocessing lab led by Gerd Sparovek at the Escola Superior de Agropecuária Luiz de
Queiroz (Luiz de Queiroz Higher Agricultural School) in Piracicaba, São Paulo (ESALQ), affiliated to the University of São Paulo (USP). Both groups spearheaded important studies of the impact of the revised Forest Code on loss of protection of APPs and Legal Reserves throughout Brazil. Sparovek also helped to coordinate the Agricultural Atlas created by Imaflora in partnership with ESALQ.

As regards NGOs, proprietary mapping and database systems have proliferated, including particularly those professionalised NGOs which work with settlers, Indigenous groups, and traditional communities in the Amazon, such as Imaflora, ICV, IPAM and ISA. There is no commensurate function being assumed by regional NGOs operating in the Cerrado, though IPAM is collaborating with regional NGOs (ISPN, Rede Cerrado and others) to identify and map the location of traditional communities throughout the Matopiba region, to counter what up to now has been their invisibility and vulnerability to land disputes. This represents an important transfer of lessons learned in the Amazon to address similar problems in the Cerrado. The geography programme at the Federal University of Bahia has also been involved in mapping of traditional communities in the state.

WHAT DATA AND TOOLS ARE MISSING AND SHOULD BE DEVELOPED?

It is clear from the discussion above that the Cerrado represents a region in which there remains a significant deficit of information regarding the processes which have led to land use change and land tenure conflict. Dispossession of smallholders and traditional communities has occurred in areas that have been consolidated over the past decade through illegal means to convert to monocultures. Although some recent initiatives have sought to restore territorial and labour rights, the data which would support a broader effort to monitor the existence of conflict is largely limited to the alerts and denunciations formulated by affected communities and reported to the CPT. There is as yet no interactive mapping or online database to cross-reference the occurrence of such conflict with spatially explicit information regarding agricultural expansion. For the present, it would be possible to indicate the presence of reported conflict, their scale (number of communities and people involved, and the area in conflict), and (possibly) the duration of such conflicts over time.

In the Amazon similar problems occur with respect to mapping of areas undergoing tenure conflict. Land grabbing is prevalent at the frontier and in areas of public forest where titling has been facilitated using the CAR as a step toward tenure legitimation. In response to such infractions, cross-referencing between the INCRA and SICAR databases has been used by the MPF to identify falsification of land titling in Indigenous territories. Greater use of these data would be a positive step toward monitoring of situations where tenure conditions are unclear or where conflicts have arisen both in the Amazon and in the Cerrado.

While considerable information exists on the status of Indigenous territories under threat of incursion or pressure from surrounding areas, export-oriented agricultural production is concentrated in settled areas of the Legal Amazon and the Cerrado and does not represent a primary motive for incursion in Indigenous areas, where mining and timber extraction have been more prevalent. Indigenous territories in Northern Mato Grosso and southern Pará which have experienced recent deforestation are exceptions, as well as indirect suppliers of cattle in beef production chains. This situation is undergoing rapid change due to the pressures from the Bolsonaro government to loosen restrictions on agricultural activities within Indigenous territories.
6. Forced Labour and Child Labour Monitoring Systems in Brazil

ERADICATION OF FORCED LABOUR
Legal and institutional structure and programs to combat forced labour

The Brazilian Federal Constitution determines that the dignity of the human being and the social foundations of work are fundamental to the Republic (art. 1), also establishing as fundamental rights (art. 5), the prohibition of inhuman or degrading treatment and the social function of property, dictating, furthermore, that the economic order (art. 170) is to be based on the social valorisation of work and the purpose of ensuring a dignified justice for all.

For the International Labour Organisation (ILO), which accompanies and monitors the various forms of slave labour worldwide, the most visible characteristic is the lack of freedom, and the most common ways of curtailing freedom are debt bondage, document retention, difficult access to the location and presence of armed guards.

In Convention 29, in 1930, the ILO adopted the expression “forced or compulsory labour”, as “all work or service required of an individual under threat of any penalty and for which he did not willingly offer himself.” In Brazil, the expression “work in conditions analogous to slavery” was chosen, with the wording given by Law 10.803/2003, which amended article 149 of the Penal Code of 1940 to specify the behaviours that constitute crime and establish penalties, namely:

Art. 149 - To reduce someone to a condition analogous to that of a slave, either by subjecting him to forced labour or exhausting work hours, or by subjecting him to degrading work conditions, or by restricting, by any means, his locomotion due to debt contracted with the employer or representative: Penalty - imprisonment, from two to eight years, and a fine, in addition to the penalty for violence.

In the most recent legislation, Normative Instruction 139 of January 22, 2018, defines in Art. 6 what it considers a condition analogous to that of a slave to which a worker submitted, individually or jointly, namely:

Forced labour; Exhaustive journey; Degrading work condition; Restriction, by any means, of locomotion due to debt contracted with employer or agent, at the time of hiring or in the course of the employment contract; Retention in the workplace due to: a) restricting the use of any means of transport; b) maintenance of overt vigilance; or c) seizure of documents or personal objects.

Below we present the institutional structure of the policies adopted to combat forced labour in Brazil, with emphasis on the mobile labour inspection unit and its systems for receiving complaints of conditions analogous to slavery. The Register of Offending Employers, better known as the “dirty list”, is widely used as a basis for due diligence in credit offerings and taxation. The post-rescue support and inclusion network aims to avoid recidivism of the worker who experienced forced labour working conditions.
National Coordination for the Eradication of Slave Labour

In addition to exercising decisive functions after rescuing the worker, such as filing collective moral damages, mediating interests between employer and employees, resolving conflicts and monitoring compliance with established agreements, the Public Labour Prosecutor (MPT) can file a public civil action in case of denial of payment of labour costs and even request the locking of assets of the employer to guarantee payment. As a result of this work, the MPT created, in 2002, the National Coordination for the Eradication of Slave Labour of the MPT (CONAETE), which implements projects aimed at inserting workers in professional qualification courses and, consequently, in the labour market, to avoid recidivism.

Offender Employer Registry (‘Dirty List’)

In 2003, the federal government created the Registry of Offending Employers, updated annually, better known as the “dirty list” through Ordinance No. 540/2004 of the now extinct Ministry of Labour and Employment (MTE), now allocated within the Ministry of Economy. By identifying individuals and legal entities that exploit forced labour and being made available to the public, the dirty list has become one of the main instruments to combat this crime in production chains. At the risk of losing access to bank financing the dirty list led numerous rural landowners to comply with labour legislation and motivated the private sector to become involved in the National Pact for the Eradication of Slave Labour that gave rise to the NGO InPACTO (described under Civil Society Monitoring Systems, below).

The dirty list was not based on a law, but on an executive order, although its constitutionality was attested by the Federal Supreme Court in September 2020 when the executive sought to abolish it.

To have one’s name included on the list, the employer does not necessarily need to be condemned in court for the crime provided for in Article 149 of the Penal Code. Inclusion in the list occurs once the employer responds to an administrative proceeding under the Ministry of Economy that may take years to complete,76 leading often to annulment of the penalty. Once mentioned on the list, an offender’s name remains there for at least two years, during which he is ineligible for credit and must prove that he is cleaning up his supply chain. According to Leonardo Sakamoto of Repórter Brasil: “Being on the list makes you a risky investment. It gives you a track record of public and private banks restricting your business. It has opened you to lawsuits, international trade restrictions and reputational damage on the international market.”77

If all labour and social security issues are resolved, and if there is no recurrence during the two-year period, the offender’s name can be removed from the list. Therefore, despite being classified as a crime, the rate of impunity for offenders is high.

A recent study by the Legal Clinic on Slave Labour and Human Trafficking at the Federal University of Minas Gerais confirmed the low rate of conviction of slave labour offenders. In the period from 2008 to 2019, of the 2,679 defendants denounced for submitting workers to forced labour, only 4.2 per cent (112) were convicted, and only 1 per cent would be subject to imprisonment. Even these were in danger of being annulled due to the sluggishness of the courts. This same study identified the inclusion of the employer’s name in the list in 36.9 per cent of 651 criminal and labour cases, with significant prevalence in Pará, origin of 23.3 per cent of the names included on the list, followed by Minas Gerais (11.8 per cent) and Mato Grosso (11.7 per cent) (Haddad, Miraglia, and Silva 2020) p. 60-61.

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76 - In view of a series of administrative procedures provided for in Interministerial Order No. 4 of 11/05/2016.
77 - https://www.theguardian.com/sustainable-business/brazil-dirty-list-names-shames-slave-labour
National Flow of Assistance to Victims of Forced Labour and the Unified Social Assistance System

The approval, in 2020, by the National Commission for the Eradication of Forced Labour (Conatrae) and by the State Commissions for the Eradication of Forced Labour (Coetrae) of the “National Flow of Assistance to Victims of Forced Labour” marked a new stage in the policy of combatting forced labour in Brazil. This document, prepared by Conatrae in partnership with the ILO, proposes an organisational chart involving public authorities and organised civil society to coordinate the actions of different federative entities.

The Unified Social Assistance System (SUAS), due to its being responsible for the shared management between the Union, states, and municipalities of services to families and individuals in situations of vulnerability or social risk, was made responsible to issue specific technical guidelines for the assistance to victims in post-rescue. In addition to welcoming actions and meeting immediate demands, its units facilitate access to public policies, the justice system, and the defence of rights, contributing to the social and professional inclusion of workers rescued from forced labour.

MONITORING FORCED LABOUR IN BRAZIL

There are several systems for monitoring forced labour in Brazil: from the executive branch (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, the federal agency responsible for inspection and the “Dirty List”. Below, we briefly present each of these systems and their specificities.

Special Group for Mobile Labour Inspection (GEFM), SIT Radar and Ipê System

The creation of the Special Mobile Inspection Group (GEFM), in 1995, was essential for the ILO to recognise Brazil as a reference in the fight against the exploitation of forced labour. The agency inaugurated a more efficient and targeted way of inspecting the occurrence of forced labour, since the group checks the complaints it receives, rescuing workers and punishing employers for labour violations committed. Made up of labour tax auditors – who coordinate field operations –, agents and delegates of the Federal Police (PF) and the Federal Highway Police (PRF), with the support of public labour prosecutors (MPT), the GEFM is supervised by the Division for the Eradication of Forced Labour (DETRAE), linked to the Labour Inspection Secretariat of the Ministry of Economy, responsible for drawing up and implementing national guidelines.

The group conducts secretive inspection operations, which are carried out mainly in rural areas. The rescued workers are guaranteed their safety and their labour rights, while the offender has punishments meted out in the civil, labour, administrative and criminal areas, in addition to his name being included in the “Dirty List”.

In 2020, with 25 years of activity and more than 54 thousand workers rescued, the GEFM adopted a new platform for receiving complaints, the Ipê System, developed in partnership with the ILO. Considered more agile in communicating with society, the Ipê System works with algorithms that allow for classification of the information received, facilitating the work of intelligence and planning. Complaints can be made through this same platform, which connects the whistle-blower directly with the auditor, or through “Dial 100”, a service provided by the Ministry of Women, Family and Human Rights, which receives denunciations of human rights violations.

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78 - https://ipe.sit.trabalho.gov.br
Data on reports of forced labour handled by the GEFM are posted on the platform Radar SIT - Statistics and Information Dashboard of Labour Inspection in Brazil, which provides the following information: municipality where the complaint was lodged, number of workers found, economic activity in which it was allocated, according to the criteria of the CNAE (National Classification of Economic Activity), as well as the unemployment insurance guides issued to workers, and the severance payments they received.

**Digital Observatory of Forced Labour**

Created by the Smart Lab of Decent Work, a partnership of the Public Labour Ministry (MPT) and the ILO, the Digital Observatory of Forced Labour in Brazil brings together the content of several databases and government reports in an integrated fashion. The dataset began with the launch of the I National Plan for the Eradication of Forced Labour, in 2003, and its objective is to contribute to the performance of public managers and civil society in the development of public policies to combat forced labour at the local level.

The Observatory’s work is based on three premises: (a) forced labour is an organised industry with its own concepts and statutes of analysis; (b) this industry is distributed in a structured manner throughout the Brazilian territory; and (c) as an organised and spatially structured industry, forced labour exhibits supply and demand curves.

Some of the Observatory’s databases are derived from the unemployment insurance system for rescued workers and the COETE, IpeaDATA Social data from the Applied Economic Research Institute (IPEA), the National Household Sample Survey (PNAD) from IBGE and the Census, also under IBGE.

Based on the cross-referencing of socioeconomic information, the platform provides statistics on remuneration and formal jobs, beneficiaries of social programs, operations, and rescues of workers in forced labour conditions, birthplace and residence of the rescued workers and flows of the recruited workers, in addition to race, gender and education. It is also possible to consult the information for each Brazilian municipality and obtain historical comparisons. All data is also tabulated on an interactive map with links to the database for each municipality where forced labour has been apprehended nationwide.

Based on this platform, it was possible to verify that 91 per cent of the rescued workers were born in municipalities whose Municipal Human Development Index (HDI-M) was considered very low by United Nations standards, and that in 57 per cent of the municipalities, one third of their inhabitants lived in households in which no resident had completed elementary school. The data thus show the correlation between poverty, human development deficits and social vulnerability, which facilitates enticement for forced labour. The municipal data could be used to cross-reference with geographic information on commodity production.

**CIVIL SOCIETY AND PRIVATE SECTOR INITIATIVES**

Historically, in Brazil, NGOs and private sector entities act in either formulating and recommending, or executing, projects that serve to fill gaps not adequately covered by public policies. In the fight against forced labour, four organisations stand out: 1) the whistle-blowing NGO Repórter Brasil; 2) The Pastoral Land Commission (CPT), which applies the most complete and long-lived system of monitoring forced labour in Brazil; 3) InPACTO, an organisation organised by the private sector, which developed a system for monitoring forced labour in the production chains; and 4) Ethos Institute of Business and Social Responsibility.
In addition to those mentioned, the efforts of the National Confederation of Agriculture Workers (CONTAG) and the National Association of Labour Attorneys (ANPT) embraced the cause of combating forced labour in Brazil; they are joined by the Landless Peoples’ Movement, the NGO Conectas, Lands of Rights and Human Rights Movement (MHuD), as well as regional and state entities, such as the Center for the Defence of Life and Human Rights in Açailândia, Maranhão and the Labour Clinic on Forced Labour and Human Trafficking of Minas Gerais.

**Pastoral Land Commission (CPT) and the Synthesis of Forced Labour Data in Brazil**

CPT is the civil society entity that receives the most reports of forced labour, having created, in 1997, the “National Campaign to Combat Forced Labour: Keeping Eyes Open to Not Become a Slave”. This campaign conducts coordinated actions with a focus on both emergency (welcoming and supporting victims after rescue) and structural concerns (supporting public policies for social and professional inclusion). This led to the creation, in 2010, of the Integrated Action Network to Combat Forced Labour (RAICE), which has partnerships in the public sector and organised civil society, among them: NGO Repórter Brasil, CONTAG, MPT, MPF, in addition to the ILO. Together, they seek to consolidate strategies to resist the risks of setbacks, also working in specific public spaces, such as Conatrae and Coetrae (Commissions for the Eradication of Slave Labour). In addition to punishing those employers responsible, the campaign seeks to sensitize companies that exploit forced labour, annul the extra profit from these crimes and confiscate those properties where forced labour is practiced.83

The “Forced Labour Data Synthesis Platform in Brazil” maintained by CPT is the oldest and most complete database on forced labour published in Brazil, covering from 1995 to the present, informing, year by year, the municipalities where the complaints occurred, the number of workers found (differentiating children and adolescents among them), the activity they performed, and the number of workers released. The platform also provides the subtotal of these data by state, and the grand total in the country.84

**National Pact for the Eradication of Forced Labour**

In 2005, a National Pact for the Eradication of Forced Labour was launched, bringing together 200 companies that made a commitment not to negotiate with those who exploit forced labour. The Pact was managed by the Coordination and Monitoring Committee, composed of the Ethos Institute, the Social Observatory Institute (IOS), the ILO and the NGO Repórter Brasil. One of the Pact’s differentials is that its signatories are pledged to fulfilling 10 commitments, among them adopting monitoring mechanisms, inspected by independent auditors, aiming to block the businesses present in the “dirty list” from their list of suppliers. The fulfilment of these commitments is monitored annually and depending on the level of commitment of a signatory company, it is maintained, suspended or excluded from the Pact.

At the beginning of 2014, the Pact already had more than 400 signatories, which together represented more than 35 per cent of Brazil’s GDP. Among the signatories are large companies in the beef sector, including the three largest Brazilian slaughterhouses: JBS, Marfrig and Minerva. To better account for its functioning and enable its strengthening and expansion, the Steering Committee then decided to create an Institute to manage and give sustainability to the Pact. In May 2014, InPACTO – the National Pact Institute for the Eradication of Forced Labour, was founded.85

**InPACTO and the Vulnerability Index**

InPACTO is a non-profit organisation focused on promoting decent work through partnerships between the productive sector, civil society, and the public sector, aiming to align with the UN Sustainable Development Goals (specifically SDG 8 Decent Work and Economic Growth, SDG 12 Responsible Consumption and Production and SDG 17, on the importance of partnerships for sustainable development).86

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86 - https://impacto.org.br
InPACTO was created to provide additional scale to the National Pact, under the coordination of the ILO, Instituto Ethos, the Social Observatory Institute, and the NGO Repórter Brasil, with the collaboration of Cargill, Carrefour, C&A, Eletrobrás, Eletronorte, André Maggi Group and Walmart Brasil.

In 2017, the entity launched the InPACTO Vulnerability Index, with support from JBS and Agrotools, with a focus on the livestock sector in the Legal Amazon. The platform’s objective is to map the factors that make a municipality, a region, and its population more vulnerable to forced and child labour, and other forms of human rights violations, and from the cross-referencing and analysis of socioeconomic and social data to establish a risk scale to inform the actions of companies in the areas affected by their ventures. There are altogether 420 national, state, and municipal indicators collected on IBGE’s statistical platforms, on the ILO’s System of Decent Municipality Indicators, and on the MPT and ILO’s Digital Forced Labour Observatory.

As the Vulnerability Index is as yet intended only for use by members of InPACTO, it was not possible to access the platform. The only information accessible to non-members is the Vulnerability Index for each state, in which stand out as those with highest vulnerability to forced labour: Mato Grosso, Mato Grosso do Sul, Rondônia, Pará, Tocantins, Rio de Janeiro and Goiás.

**Ethos Institute for Social Responsibility**

Founded in 1998, the Ethos Institute of Business and Social Responsibility is an OSCIP (Civil Society Organisation in the Public Interest) whose mission is to mobilise, raise awareness and help companies to manage their businesses in a socially responsible manner. Between 2002 and 2015, the entity participated in the implementation of several public policies, in particular those aimed at combating slave labour and climate change, among them, the National Pact for the Eradication of Forced Labour (regulation of the prohibition of public and private financing for the “dirty list”); the Approval of the Constitutional Amendment proposal on Forced Labour (57-A / 1999); the Regulation of the National Policy on Climate Change and the harmonisation of public policies; the National Aichi Biodiversity Goals Plan for 2020, and the Climate Agreement adopted at COP 21 in Paris. Ethos is a member of the UN Global Compact and, together with the ILO and the NGO Repórter Brasil, played a decisive role in the construction of the National Pact for the Eradication of Forced Labour beginning in 2005.

**NGO Repórter Brasil**

Founded in 2001 by journalists, social scientists and educators in order to encourage reflection and action on the violation of the fundamental rights of peoples and workers in Brazil, Repórter Brasil has become one of the main sources of information on forced labour in the country, with emphasis on a long term effort for “Research on the Forced Labour Productive Chain”, undertaken with the ILO, a series of studies that identify the production chains in which the farms that are part of the “Dirty List” are inserted (Costa 2009). In addition to Journalism and Research, the entity developed an Educational Methodology, aimed at training researchers, public managers, workers, and community leaders, with emphasis on the project “Slave, Don’t Even Think About It! (Escravo, Nem Pensar!)”. Together with the Ethos Institute, the organisation was the articulator of the National Pact for the Eradication of Forced Labour, in 2005.

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87 - The Constitutional Amendment project provides for an addition to Article 243 of the Constitution, to provide for expropriation of land and improvements associated with incidence of forced labour. See: https://reporterbrasil.org.br/2014/06/congress-approves-expropriation-of-property-found-with-slaves/

88 - https://www.ethos.org.br/wpcontent/uploads/2020/03/Apresenta%C3%A7%C3%AAo_Institucional_2020-Atualiza%C3%A7%C3%AAo_03.02.pdf

89 - www.reporterbrasil.org.br
FORCED LABOUR IN THE MEAT AND SOY CHAINS

The sector in Brazil where the problem of forced labour is most concentrated is that of livestock. According to data from the Federal Government systematised by the CPT, more than half of the cases of forced labour identified in Brazil between 1995 and 2020 took place in the livestock sector: 1,950 cases, representing 51 per cent of the total. Furthermore, livestock is also the sector from which most forced labourers were rescued during this period: 17,253 (31 per cent of those released).

According to the recently issued Repórter Brasil Monitor #8 on forced labour in the cattle industry, most cases of forced labour in livestock do not occur on farms that supply animals directly to the slaughter, but on breeding and rearing properties that transfer cattle to fattening in other establishments. Therefore, even though they have assumed commitments to block their indirect suppliers, in the absence of traceability mechanisms, even the largest Brazilian slaughterhouses, such as JBS, Marfrig and Minerva which are responsible for over 70 per cent of exports (signatories to the National Pact for the Eradication of Forced Labour; see above), cannot guarantee the origin of the totality of their livestock. In 2012, JBS was suspended from the Pact for failing to comply with obligations provided for in the monitoring of the supply chain, but in January 2014, was readmitted (Gomes 2021).

For 2019, according to data from the CPT platform, in addition to Minas Gerais, the states with the highest number of complaints were Pará, Mato Grosso, Mato Grosso do Sul, Rondônia, Roraima and Tocantins. And, in all of them, livestock appears as the sector that concentrates the greatest number of workers in forced labour conditions, as shown in Table 2, below. These states together account for 21.3 per cent of total complaints and 13.5 per cent of enslaved workers, 57 per cent of whom are found in livestock.

<table>
<thead>
<tr>
<th>State</th>
<th>Number of cases</th>
<th>Forced labourers found</th>
<th>Livestock sector</th>
<th>Forced labourers rescued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pará</td>
<td>11</td>
<td>68</td>
<td>36 (53%)</td>
<td>56</td>
</tr>
<tr>
<td>Mato Grosso</td>
<td>5</td>
<td>16</td>
<td>7 (44%)</td>
<td>16</td>
</tr>
<tr>
<td>Mato Grosso do Sul</td>
<td>7</td>
<td>44</td>
<td>30 (68%)</td>
<td>37</td>
</tr>
<tr>
<td>Rondônia</td>
<td>3</td>
<td>39</td>
<td>17 (43.5%)</td>
<td>34</td>
</tr>
<tr>
<td>Roraima</td>
<td>3</td>
<td>16</td>
<td>10 (62.5%)</td>
<td>16</td>
</tr>
<tr>
<td>Tocantins</td>
<td>1</td>
<td>4</td>
<td>4 (100%)</td>
<td>4</td>
</tr>
</tbody>
</table>


As for the soy crop, slave labour conditions are far less prevalent. Slave labour complaints were resolved in Piauí, with 29 workers (27.6 per cent of the total population of forced labourers found in the state), and in Mato Grosso, seven workers. In 2019, only four per cent of workers in forced labour conditions worked in soy production, according to the most recent CPT data. The scale of forced labour apprehension in the two segments over time is described from Radar statistics in Figure 9. It is clear from the series that the number of forced labourers freed in the livestock sector has been declining, particularly after 2007, possibly related to the decline in deforestation and opening of new agricultural frontiers. The detection and enforcement of forced labour laws has declined significantly under the Bolsonaro administration.
Soy and livestock on the Dirty List

The first reference to the inclusion of soy farmers in the dirty list occurred in 2007 with Fernando Ribas Taques and Leandro Mussi, who sold to Bunge, which, at the time, was the largest agribusiness company operating in Brazil. Bunge had committed itself to cut commercial relations with farms mentioned in the dirty list when it joined the National Pact for the Eradication of Forced Labour, in 2006. These farms were located in Sinop and Alto Parnaíba, municipalities that are on the list of the largest soy producers in their states, respectively, Mato Grosso and Maranhão. Since then, the participation of soy producers in the dirty list has been increasingly rare, perhaps because they find it easier to have their names removed from the list.

Cattle ranching led the 2010 dirty list by far, accounting for 48 per cent of the 220 farms assessed, followed by coal (16.3 per cent). After ten years, the activity "cattle breeding" still remains one of the most striking (Dirty List of April 5, 2021), representing 12 per cent (11) of the total number of employers included on the list (92). Three other activities appear very close to cattle: “coffee cultivation” (11), “timber harvesting in planted forests” (10) and production of charcoal from native forests” (5). Together, these four activities concentrate 40 per cent of all employers that make up the 2021 list. This represents a significant reduction in the weight of cattle ranching in the number of workers exploited as forced labourers.

However, what has not changed are the states where the farms are located (Pará, Maranhão, Tocantins, Mato Grosso do Sul, Mato Grosso, Goiás and Bahia), and the participation of the assessed employers in the meat production chain. Members of the 2007 dirty list, Antenor Duarte do Valle and Renato Bernardes Filgueiras are two examples of this reality; both sold animals to the Tangará da Serra (MT) unit of Marfrig, the fourth largest meat producer in the world. The slaughterhouse supplied to the main retail chains in the country (Carrefour, Walmart and Pão de Açúcar) and to snack bars, including McDonald’s. The three large retail chains signed the National Pact for the Eradication of Forced Labour and claimed, at the time, to have discredited slaughterhouses that buy from farms caught with forced labour. McDonald’s and Marfrig also signed the pact after being alerted to these problems.

These same companies are involved in the latest version of the dirty list (05/04/2021). According to an investigation by Repórter Brasil, rancher Maurício Pompeia Fraga, caught exploiting 30 workers as forced labourers, sold cattle to JBS and Marfrig even after labour inspection found the presence of forced labour on his ranch in June 2018.
RECENT CHANGES IN THE POLICY TO COMBAT FORCED LABOUR

One of the major bottlenecks in the fight against forced labour is the risk of recidivism of rescued workers due to lack of protection or their difficulties in being included in the formal labour market. To this end, an interinstitutional network focused on prevention and post-rescue support was organised, composed of public bodies for the defence of work and social assistance. However, in the current administration, several of these bodies have been weakened in their functions of coordination, inspection, and punishment.

When President Jair Bolsonaro took office in 2019, declaring himself favourable to the easing of regulatory measures, he extinguished the Ministry of Labour and Employment, transferring its duties to the newly created Ministry of Economy, among them, the inspection of forced labour. As a result, due diligences have been drastically reduced, are not occurring or are not being properly registered. In addition, the budget to combat forced labour was reduced by 41 per cent in 2020 (the amount spent was R$ 1.3 million (about EUR 200,000), the lowest in 10 years), according to information from the Ministry of Economy.

As we have seen, the main component of this network is the Labour Auditor, responsible for coordinating GEFM operations. However, after “dismantling”, their autonomy was drastically reduced with the changes introduced. Originally, the labour auditor was responsible for the main duties (assessing working conditions; taking testimony from workers and employers; checking the record in the work card; carrying out assessments; guaranteeing workers’ rights and the obligations of bosses and employees), in addition to being authorised to issue work cards, notify the employer of the payment of fines, terminate contracts and issue special unemployment insurance. However, with the changes in the labour laws, these roles were significantly undercut, including the elaboration of inspection routines, giving individuals outside the career of the Labour Auditor the final decision on the penalties imposed, as well as the prerogative to standardise its jurisprudence. Both measures significantly reduced the autonomy of the labour tax auditor and, consequently, increased the degree of impunity for offenders.

The result of the set of changes implemented by the current government can be seen in a significant drop in apprehensions of forced labourers registered by the Radar system.

94 • Changes were made in the Consolidation of Labour Laws (CLT) by Provisional Measure 905/2019.
Combating Child and Adolescent Labour

**LEGISLATION AND INSTITUTIONAL STRUCTURE**

The fight against child labour was an obligation imposed by the Federal Constitution of 1988, whose article 227 assured that it is the duty of the family, society and the State “to guarantee to children and adolescents, with absolute priority, the right to life, to health, food, education, leisure, professionalisation, culture, dignity, respect, freedom and family and community coexistence, in addition to keeping them safe from all forms of neglect, discrimination, exploitation, violence, cruelty and oppression.” Amendment no. 20, of December 15, 1998, changed article 7 of the Constitution by establishing that 16 years be the minimum age for access to work, except for employment in apprenticeship, allowed from 14 years old.

The condemnation of child labour was contemplated in the Child and Adolescent Statute (ECA) of 1990, in its articles 60 to 69, which deal with the right to professionalisation. Furthermore, Chapter IV of the Consolidation of Labour Laws (CLT) prohibits work by minors under 18 years of age when it is dangerous, unhealthy, painful, nocturnal, and harmful to physical, psychological, moral, and social development.95

The institutional structure erected with the mission of eradicating child labour in Brazil was only put in place after the country became a signatory to ILO Convention 138, which provides for the minimum age for admission to employment, and Convention 182, which deals with the worst forms of child labour. According to Convention 138, every member country must follow a national policy that ensures the end of child labour, while Convention 182 states that every member country must design and develop programs of action to eliminate the worst forms of child labour.

National Commission for the Eradication of Child Labour and the National Plan for the Prevention and Eradication of Child Labour and Protection of Adolescent Workers

Based on the commitments assumed with the ILO, in 2002, the Ministry of Labour and Employment instituted the National Commission for the Eradication of Child Labour (CONAETI),96 which had among its attributions to elaborate the proposal of a “National Plan to Combat Child Labour”; regulate conventions 138 and 182; and to coordinate, monitor and evaluate the execution of the “National Plan for the Eradication of Child Labour and Protection of Adolescent Workers”.

Also, within the scope of CONAETI, the text of Decree No. 6,481, of June 12, 2008, was drawn up, which defined the “List of the Worst Forms of Child Labour (TIP List)”, in accordance with the provisions of Convention 182, which, being one of the ILO’s fundamental conventions,97 requires reporting every two years.98

According to the “National Plan for the Prevention and Eradication of Child Labour and Protection for Adolescent Workers”, economic and survival activities carried out by children or adolescents under the age of 16 are considered child labour, except as an apprentice, starting at 14 years, whether remunerated or not, with or without the purpose of profit.99

The TIP List100 lists those activities considered harmful to the health, safety or morals of the adolescent, and which can only be practiced by people over 18 years of age, namely: “all forms of slavery or similar practices, such as sale or trafficking, bondage or debt bondage, servitude, forced or compulsory labour; the use, demand, offer, trafficking or solicitation for purposes of commercial sexual exploitation, production of pornography or pornographic performances; the use, recruitment and offer of adolescents for other illicit activities, particularly for the production and trafficking of drugs; and the forced or compulsory recruitment of adolescents to be used in armed conflicts.”101

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95 - [https://www2.senado.leg.br/bdsf/bitstream/handle/id/534718/eca_1ed.pdf](https://www2.senado.leg.br/bdsf/bitstream/handle/id/534718/eca_1ed.pdf)
96 - MTE Portaria n° 365, de 12/09/2002
98 - Until 2015, the government met the deadlines and requirements, however, since that year, it has not forwarded new information to the ILO Committee of Experts.
100 - List of Dangerous Child Work (TIP)
Complaints can be sent to the National Council for the Rights of Children and Adolescents (CONANDA), to the Ombudsman of the Labour Courts or through the Regional Labour Superintendencies. There is also Dial 100, a communication channel between civil society and public authorities, which provides information about the protection system. Calls can be made from any location in Brazil toll-free, from any fixed or mobile phone.

**CIVIL SOCIETY INITIATIVES**

Unlike forced labour, the issue of child labour has received less attention from organised civil society. Perhaps this is true because it is a situation Brazilian society has hardened itself to, seeing children and adolescents work, especially in commerce and rural activities, but also as homeless beggars at street corners scratching out a survival in Brazil’s cities.

Here, we indicate only two entities, one under the auspices of organised civil society (FINPETI) and another from the private sector (Fundação Abrinq), as they are the oldest, both produce quality content and carry out a systematic and consistent monitoring of everything that involves the theme, as evidenced by their participation in the formulation and evaluation of public policies and as members of several councils, in addition to organising events and campaigns.

It is also worth mentioning the National Confederation of Rural Workers (CONTAG), which participated, in 1996, in the implementation of the Child Labour Eradication Program and, since then, has been a member of the National Commission for the Eradication of Child Labour and the National Forum for the Prevention and Eradication of Child Labour. On the part of civil society, the NGO Repórter Brasil is an important reference for its actions at the interface between child and forced labour.

**National Forum for the Prevention and Eradication of Child Labour - FINPETI**

The main and longest-running initiative of organised civil society in the fight against child labour is the National Forum for the Prevention and Eradication of Child Labour, created in 1994, with the support of the ILO and the United Nations Fund for Children (UNICEF). An autonomous instance of social control, FINPETI brings together institutional social actors, involved in policies and programs for the prevention and eradication of child labour in Brazil, with the objective of defining strategies and creating bridges between governments and civil society. FINPETI members are the State Forums for the Prevention and Eradication of Child Labour, representatives of the federal government, workers, employers, the justice system, as well as civil society entities and international organisations (ILO and UNICEF).

The forum coordinates the National Network to Combat Child Labour, formed by the 27 Forums for Child Labour Eradication and Protection of Adolescent Workers and its 48 member entities, and produces content and analysis on child labour in Brazil, available on the entity’s website. Among its achievements, we highlight the methodology of the Child Labour Eradication Program (PETI), based on the experience of the Integrated Actions Plan (PAI), developed by the entity in 1995, aiming to combat child labour in the charcoal kilns of the state of Mato Grosso do Sul, and its role as a full member in the installation of CONAETI, in 2002, and in the elaboration of the “National Plan for the Prevention and Eradication of Child Labour and Protection for Adolescent Workers”, launched in 2005.

**Abrinq Foundation**

The Brazilian Association of Toy Manufacturers (Abrinq) in accordance with its mission to reduce the violation of the rights of children and adolescents in Brazil, in particular child labour, created, in 1989, a Directorate for the Defence of the Rights of the Child, which, the following year, became the Abrinq Foundation for the Rights of Children and Adolescents.

[102 - https://fnpeti.org.br/]
In line with the Brazilian constitutional precepts and the UN International Convention on the Rights of the Child, the Abrinq foundation operates throughout the national territory, providing free social assistance services, mobilising parliamentarians to improve legislation regarding children and adolescents; advising civil society organisations, companies and governments; engaging municipal managers in the cause of childhood and adolescence; and facilitating the population’s access to information about vulnerabilities in their locality in order to enable them to demand public policies.

Its instruments of action are the production of content, the training of professionals in the Unified Social Assistance System (SUAS), education and tutelary councils, awareness and mobilisation campaigns and projects. One of them, the Mayor Amigo da Criança Program, started in 1996, offers technical support to municipal managers to strengthen their role in protecting children and adolescents. Through its six editions, 10,080 municipal mayors participated.

Since 2016, Abrinq has published the “Childhood and Adolescence Scenario in Brazil”, in which it presents a series of social and economic indicators, based on IBGE statistics, relating them to the Sustainable Development Goals (SDGs). The indicators are available at the Observatory for Children and Adolescents, where it is possible to compare data between regions, states and municipalities and generate spreadsheets.

In 2017, Abrinq published the study “The challenge of child labour in agricultural activities”, which maps the situation of child labour in agricultural activities, including cattle raising and soy cultivation (see below).

**CHILD LABOUR MONITORING SYSTEMS**

Officially, the responsibility for inspecting and assessing the existence of child labour lies with the Labour Tax Auditors, linked to the Ministry of Economy’s Subsecretariat for Labour Inspection (SIT). However, when entering the Radar SIT platform link, there is no record on child labour. A notice informs that “the page is under construction.” The same is true of the site’s section on apprenticeship.

**Observatory for the Prevention and Eradication of Child Labour**

In 2019, the Public Ministry of Labour launched, in cooperation with the ILO, the “Observatory for the Prevention and Eradication of Child Labour”, on its SmartLab platform, that also monitors and analyses the data on forced labour in Brazil. The Observatory has the support of the National Council for the Public Prosecution (CNMP), IBGE, and FINPETI.

The data comes from public and official repositories that are part of the National Statistical System, with emphasis on the census surveys of the IBGE and in the areas of Education, Health, Labour and Social Security, Justice, and Assistance and Social Development. Cross-checking the information provided by each of these databases allows for a complete analysis of the situation in each municipality. The platform is available to the public and is friendly and accessible.

SmartLab was designed based on the ILO Decent Work concept, formalised in 1999, as a result of the convergence of four strategic objectives of the entity: a) respect for rights at work, defined as fundamental (freedom of association, right to collective bargaining, elimination of all forms of discrimination relating to employment and occupation and the eradication of all forms of forced and child labour); b) promotion of productive and quality employment; c) expanding social protection and d) strengthening social dialogue (Menezes and Miziara, 2020).

The Observatory is based on the premise that child labour and forced labour are interrelated phenomena, since there is a high probability of children subjected to work becoming exploited workers, and their children also becoming victims of child labour, involving the whole family in this vicious circle of human rights violations. Consequently, these phenomena must be understood together to formulate public policies of integrated repression and prevention.

103 - [http://observatoriocrianca.org.br](http://observatoriocrianca.org.br)
104 - [SIT Abas (trabalho.gov.br)](https://www.trabalho.gov.br)
105 - [https://smartlabbr.org/trabalhoinfantil](https://smartlabbr.org/trabalhoinfantil)
Brazilian Institute of Geography and Statistics

The IBGE is an entity of the federal public administration, linked to the Ministry of Economy, which constitutes the main provider of data and statistical information in the country in the three governmental levels (federal, state, and municipal), providing a complete and up to date overview of the country.

As the main source of research data on child labour, IBGE annually publishes a detailed statistical survey on the socioeconomic profile of children and adolescents, the distribution of child labour in the national territory and allocation by sectors of economic activity, based on the Continuous National Sample of Households (PNAD) on Child and Adolescent Labour.

PROFILE OF CHILD LABOUR IN BRAZIL

In Brazil, according to the PNAD, the problem of child labour has been a challenge for public policies, because in addition to being complex and historically rooted, the results of the recent measures taken are meagre when compared to prior figures. From 1992 to 2015, there was a substantial reduction of two-thirds in the number of children and adolescents in child labour in all sectors. In absolute numbers, this amounts to a reduction of 5.1 million cases (from 7.8 million in 1992 to 2.7 million in 2015). However, there are still many children and adolescents in this situation in the country.

While the gains have been significant, PNAD data from 2016 to 2019 confirm a slowing in the rate of eradication of child labour. In 2019, of the 38.3 million people between 5 and 17 years of age, 1.8 million were still in child labour, corresponding to about 5 per cent of the total population in this age group, with an insignificant proportional percentage drop in relation to 2016.

The profile of child and adolescent workers remains the same: boys (66.4 per cent), blacks (66.1 per cent), the majority between 16 and 17 years old (53.7 per cent), with children from 5 to 13 years old corresponding to 21.3 per cent of the total, as well as the concentration by economic sector: cattle and other livestock occupy 46.8 per cent of this workforce, while the production of temporary crops accounts for 35.2 per cent. Together, these activities represent 82 per cent of all child labour situations in the sector in Brazil.

Between 2006 and 2017, there was a reduction from 1,062,306 to 580,052 of children and adolescents under 14 years of age in agricultural work. The reduction of child labour between 2006 and 2017 in Brazil occurred in all five regions of the country and in most of the states. In 2019, data on children and adolescents in the worst forms of child labour were released for the first time (TIP List). There were 706 thousand people from 5 to 17 years old in these occupations, which correspond to 39.2 per cent of the total number of working children and adolescents, with the highest percentage (65.1 per cent) being in the age group of 5 to 13 years old, and 20.6 per cent were in agricultural activity.

The preliminary results of the 2017 Agricultural Census, also carried out by IBGE, showed the existence of approximately 588 thousand children under the age of 14 working in agricultural establishments, despite illegality. This contingent of children in a situation of prohibitive work corresponded to 3.9 per cent of the total workforce employed in agricultural establishments. In some states, particularly in the Amazon states of Roraima (12.7 per cent), Amazonas (11.3 per cent) and Pará (8.3 per cent), the share of the workforce made up of children under 14 years of age was even more worrying. In 245 municipalities (4.5 per cent of the national total), child labour corresponds to at least 10 per cent of the total agricultural workforce, reaching up to 48.2 per cent.

[106] - https://fnpeti.org.br/cenario/ based on data from IBGE.
The distribution of child labour according to the existence of family ties with the producer is relevant to this analysis. It is well known that in Brazil family farming uses child labour. According to the 2017 Census of Agriculture, the child worker with a family relationship corresponded to 86.3 per cent of the total. Although in the country, child labour in establishments with no family ties to the producer thus represented only 13.7 per cent of the total, in some states it assumed significant proportions. This was particularly true in São Paulo (59.7 per cent), Mato Grosso do Sul (32 per cent) and Espírito Santo (30 per cent), respectively, the largest producer of sugarcane, the fifth largest herd of cattle in the country, and the second largest producer and exporter of coffee.

CHILD LABOUR IN LIVESTOCK ACTIVITIES AND SOY CULTIVATION

In 2017, the Abrinq Foundation published the study “Child Labour in Brazil: the challenge of child labour in agricultural activities”, in which it presents the situation of child labour in agricultural production based on the CNAE (code of the main economic activity of the enterprise), from IBGE, which makes it possible to focus on livestock activities and soy cultivation, although it is not possible to map the entire production chain. (It should be noted that the data analysed are from the year 2015.)

The first data to be highlighted is that of “people between 10 and 17 years old engaged in agricultural activities according to the record in their work card”. In the Amazon (except for Rondônia) and the Northeast, none of these had a formal contract. In the Cerrado region, the situation is a little better, although the universe of workers between 10 and 17 years old who had a formal contract was very small, only 13 per cent of the total.

The use of the CNAE allows the research to focus on livestock and soy activities in the table “People between 10 and 17 years old engaged in agricultural activities according to the record in the work card”. In the cultivation of soy, we have 2,554 between 10 and 14 years old and 8,502 between 15 and 17 years old, totalling 11,056 people registered in the portfolio, which corresponds to 1.4 per cent of the total of Brazilian children and adolescents who worked in 2015 with a signed work card. Therefore, the participation of soy producers in the hiring of this workforce is insignificant.

On the other hand, the CNAE code “cattle breeding” employed 50,809 people between 10 and 14 years old, and 79,218 between 15 and 17 years old, totalling 130,027, which corresponds to 16.5 per cent of the total of Brazilian children and adolescents between 10 and 17 years registered on the work card.

Therefore, cattle breeding, in 2015, was the activity that most occupied this type of labour among all 29 activities classified in the CNAE.

We can conclude that this situation contaminates the entire meat production chain, as indicated by the literature on the subject (a study by the ILO in 2009 found significant employment of child labour in slaughterhouses in Brazil (Costa 2009)), as well as confirming the interrelation between child and forced labour, whose incidence is also greater in livestock. However, since there is no “dirty list” associating cases of child labour with enterprises, it is difficult to trace the presence of child labour practices to specific sources of agricultural or animal products.

Work accidents with children and adolescents

Between 2007 and 2019, in Brazil, 279 children and adolescents aged 5 to 17 years died and 27,924 suffered serious accidents while working. In the same period, 46,507 boys and girls had some type of health problem due to work. The data are from the Ministry of Health’s Notifiable Diseases Information System (Sinan) and show how harmful early work is to health.\textsuperscript{109}

The Sinan survey shows that most victims worked informally, in construction and agriculture activities, or as domestic servants and butchers. All such activities were defined by Decree 6.481/2008 as the “worst forms of child labour” (TIP List).

Figure 10 below, on intoxication related to occupational accidents in children and adolescents, shows that agricultural pesticides are, by far, the most harmful agent in the age group of 14 to 17 years, representing more than 40 per cent of all occupational accidents.

Figure 10. Exogenous poisoning related to occupational accidents in children and adolescents according to toxic agent and age group. Brazil, 2007 to 2019. (Partial data, subject to updates for 2016, 2017, 2018 and 2019.

FINAL CONSIDERATIONS

As Leonardo Sakamoto, director of the NGO Repórter Brasil, observed, child labour in Brazil is “a symptom of chronic social inequality, the concentration of income and the lack of equal opportunities guaranteed to families, so that children can develop fully.”\textsuperscript{110} The lack of public policies for transferring income and social assistance to the neediest, made the domestic work of children and adolescents invisible to society. The recruitment of these workers for profitable economic activities benefits from this invisibility, as well as from the lack of monitoring and enforcement of the relevant legislation.
The perspective that the condition of child labour may be reversed under the current administration appears remote. In its first year the Bolsonaro government extinguished the CONAETI in April 2019. Though the Council resurrected itself, in December 2020, this was only permitted after removal of the representation of the civil and judicial institutions that lead public policy in the area. The commission was thus seriously compromised in its competence and autonomy. The Public Prosecutor’s Office of Labour, the National Forum for the Prevention and Eradication of Child Labour, the main representative of civil society, the National Council for the Rights of the Child and do Adolescent (CONANDA), which is responsible for the formulation, deliberation and control of public policies for children and adolescents in Brazil, and the ILO, an institution that motivated the implementation of the policy for the eradication of child labour in Brazil were not included in the new composition. The new composition is tripartite: six representatives of the government, six of the employees and six of the employers, and no union entity was invited to participate, on the grounds that they are not representative of the interests of children and adolescents. The change in the composition of CONAETI was intensely criticised, as it represents a lack of commitment by the federal government to the problem of child labour.

In addition, in the III National Plan for the Prevention and Eradication of Child Labour and Protection for Adolescent Workers (2019-2022), the federal government made no mention of child and adolescent labour in economic activity, thus making this plan innocuous as a tool for the formulation of monitoring policies in the soy and meat production chains.

Finally, it should be noted that the year 2021 was approved, by an act of the UN General Assembly, as the International Year for the Elimination of Child Labour. Brazil showed significant progress in the past and must overcome barriers to continue this effort. Due diligence of agricultural and business practices in this area is needed to complement national efforts to curtail child labour and harm.

Photo: Katie Maehler/Mídia NINJA. The Amazon Brigade team visited Acre, Brazil, to show how forest peoples live and sustain themselves by preserving the forest.

111 - https://www.in.gov.br/en/web/dou/-/decreto-n-10.574-de-14-de-dezembro-de-2020-294065238
7. Environmental health and safety

It is estimated by the World Health Organisation that agrochemical intoxications are misdiagnosed or seriously underreported, there being an estimate of 1 out of 50 cases reported. Nevertheless, national data on intoxication in Brazil (National System of Toxic and Pharmacological Information-Sinitox) clearly show that such intoxications are common and are often associated with suicide in rural areas. According to data from the Ministry of Health, between 2010 and 2019 more than 15,000 people used these products in attempted suicide. Furthermore, the site informs that data on recent years on all classes of intoxication are underreported. The Ministry of Health manages the SINAN database of all sickness and epidemiological conditions in Brazil, beginning in 2007. According to SINAN data disclosed by Repórter Brasil, 45,700 people were attended in hospitals and diagnosed with intoxication by agrochemicals between 2010 and 2019.

Agrochemical use is significant in Brazil, and although its use is regulated and requires the use of protective equipment, these requirements are often not followed. For example, it is prohibited to apply agrochemicals without a prescription and by someone who has not received training in their manipulation. According to the agricultural census of 2017, nearly 90 per cent of those who utilise agrochemicals declared having had no technical orientation regarding their use. The unprecedented proliferation of agrochemicals authorised for use in Brazil since the inception of the Bolsonaro administration may have also resulted in over-application or misuse.

In 2015, Brazilian farmers planted 71.2 million ha in crops (IBGE, 2017). In that year, soy, maize and sugarcane were responsible for 76 per cent of all agricultural land in the country and absorbed 82 per cent of the 899 million litres of agrochemicals applied. Soy is the principal crop (32.2 million ha) and the highest absorber of agrochemicals, at 17.7 l/ha, followed by maize (14.8 million ha; 7.4 l/ha), sugarcane (10.2 million ha; 4.8 l/ha) and cotton (1.0 million ha; 28.6 l/ha) (Pignati, Oliveira, and Silva 2014).

According to studies by the Ministry of Health, glyphosate was the agrochemical most commercialised in Brazil in 2014 (488 million kilogrammes (kg), or 31.45 per cent by weight of all agrochemicals commercialised in Brazil) followed by 2,4-D and mineral oil (Secretaria de Vigilância em Saúde Ambiental e do Trabalhador 2018). It is worth mentioning that the USEPA is investigating the effects of these same compounds on endangered fish species due to ongoing litigations by NGOs. In the case of 2,4-D there is a proposed bill under consideration in the Brazilian Congress to prohibit its production, importation, commercialisation, and use. Other proposals for reduction in agrochemical use have also been introduced, but they are in direct contradiction to the Bolsonaro administration’s fast track authorisation of an exceptional number of agrochemicals into the Brazilian market.

It would be desirable for environmental monitoring purposes that the registry of agrochemical use be reported, at a municipal level, in relation to the quantity used and in what crops. Researchers at the University of São Paulo published a Geographic Atlas of agrochemicals prohibited in the EU but authorised for use in Brazil (Bombardi and Garvey 2017). The atlas lists for each major crop grown in Brazil, the principal agrochemicals used in their production prohibited for use in the EU. The same maps show the areas in Brazil from which each crop is exported and the volume of exports to the EU in 2016. (Admittedly, this does not mean that the crops exported to the EU employed the prohibited chemicals.) Soy is among the crops with greatest intensity of agrochemical use in Brazil. Depositions by women exposed to pesticide spraying in the Cerrado express fears for their reproductive health and the safety of their children.

113 - https://sinitox.icict.fiocruz.br/
116 - https://agenciadenoticias.ibge.gov.br/agencia-noticias/2012-agencia-de-noticias/noticias/25790-numero-de-estabelecimentos-que-usam-agrotoxicos-sobe-20-4
118 - PL no. 560/2019.
A recent report on social and environmental externalities in the beef and soy/maize farming systems in the Legal Amazon showed significant health problems related to particulate matter from forest burning and pesticide intoxication in areas subject to deforestation and exposure to pesticide spraying, often done by airplane. The air quality effects of forest fires on human health in the Amazon was subject to a series of comparative studies of children and elderly in Mato Grosso and Acre in 2005, showing a significantly higher incidence of hospitalisations for respiratory disease in periods subject to forest fire. A 2019 study by IPAM in collaboration with Human Rights Watch and the Institute of Studies for Health Policies (IEPS) found that there were 2,195 hospitalisations due to respiratory illness attributable to deforestation related fires in the Brazilian Amazon in that year, primarily in the months of July and August, the peak burning season (HRW/IPAM/IEPS 2020).

Water quality is affected by sedimentation and pesticides, as well as by effluents from slaughterhouses and cattle feedlots increasingly adopted to fatten cattle in the last 6 months before slaughter (May 2019). Besides water quality concerns, the intensive use of irrigation in the Cerrado has brought considerable concern regarding the provision of water for other uses, including human consumption. The combination of suppression of native vegetation and irrigation may result in water scarcity (Spera et al. 2016). A recent study by Instituto Escolhas measured the carbon and water footprints of the beef cattle industry in Brazil at, respectively, 78 kg carbon dioxide equivalent (CO₂e) and 64 l per kg of beef produced between 2000 and 2007 (Leitão and Wattanabe, 2020).

The spread of COVID-19 into Indigenous areas throughout Brazil and the slow response on the part of the federal government to provide health system support has been likened to genocide. The risk of viral epidemics due to zoonosis from past disturbance of animal habitats in Asia and Africa has important implications for the protection of Indigenous areas in Brazil.

Data on deforestation and forest degradation produced by INPE are also a warning of the probability of COVID-19’s advance on Indigenous populations. A recent study by the Geneva Centre for Research in Economics and Public Policy examined the effect of deforestation on the transmission of COVID-19 to Indigenous Peoples and its transmission mechanisms. The study used municipal data on COVID-19 and data from the DETER system, which were applied to mathematical models of fixed effects. Estimates show that the increase of one unit in deforestation per 100 km² is associated, on average, with the confirmation of 2.4 to 5.5 new daily cases of COVID-19 in Indigenous Peoples 14 days after the deforestation alerts released by DETER. A km² deforested today results in 9.5 per cent more new cases of COVID-19 in two weeks. In cumulative terms, deforestation explains at least 22 per cent of all confirmed COVID-19 cases among Indigenous Peoples by August 31, 2020. Evidence suggests that the main mechanisms by which deforestation intensifies human contact between Indigenous and infected are illegal mining and conflicts (Laudares, 2020). The risks of continued deforestation and forest degradation at the agricultural frontier may also include exposure to zoonotic transfer of pathogens yet unknown whose potential devastation was only made clearer by the COVID-19 pandemic (Gebara, May and Platais, 2021).
8. How would the EU Observatory use the Brazilian data?

8.1. Datasets required

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

The data required to be able to implement and enforce such an EU due diligence regulation depends both on the focus and scope as well as the content of the regulation. E.g., if a regulation would focus on mitigating deforestation, only deforestation data would be required; if a regulation would include mitigating human rights violations, those data would be needed as well.

The type of due diligence required is important as there are two different due diligence concepts: (1) due diligence as a continuous process of improvement, deriving mainly from the United Nations Guiding Principles on Business and Human Rights agreed in 2011; (2) due diligence as a process that is undertaken before a decision is made, or a product is permitted to be placed on the market, relating to a process that must be carried out before a decision is made or an action carried out. This is common particularly in the world of finance and investment and is generally present in legislation governing the duties of financial agents as well as in the EU Timber Regulation.119

If we assume the regulation will not only require companies to set up a due diligence system but also includes either guidance or thresholds around maximum risk tolerance or a prohibition and would focus on deforestation and human rights violations, the following data should be accessible: deforestation data (see Table 1 in this report); data documenting human rights violations; data indicating different land uses; supply chain data (including supply chain traceability and mapping, business relationships and company ownership). We will look at each in turn.

8.2. Deforestation and forest degradation data and relevant data for other ecosystems.

As Table 1, in section 4 shows, there are several datasets available in Brazil and in the public domain that could be used by the EU to monitor deforestation, using satellite data with various resolutions and varying timeframes. Some organisations generate satellite data themselves, others use the generated data and interpret them. Stitching some of these together because of different frequencies of collection etc. could be important.

If the EU legislation were to only focus on deforestation, datasets covering the Amazon, the Cerrado, the Pantanal120 and the Atlantic forests as well as the Caatinga would be required, but as the latter doesn’t have much relevance for commodity production and the Atlantic Forest has effectively controlled most deforestation since there is not much forest left, the focus is really on the Amazon and the Cerrado, with some residual concern for the Pantanal which has recently suffered severe fires. This obviously also depends on the definition of forest or natural ecosystems used.

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119 - For more information see Fern’s paper on ‘Enforcing Due Diligence’ at https://www.fern.org/publications-insight/enforcing-due-diligence-legislation-plus-2230/
120 - The Pantanal is a traditional supplier of good quality beef on open natural rangelands that are inundated in the rainy season. There is a strong WWF “green beef” effort underway there with certification and international buyers.
It should be noted that according to some, not all datasets are sufficiently detailed. Some e.g., don’t allow for a distinction to be made between ‘deforestation’ and e.g., a replanting of an existing palm oil plantation. But for Brazil e.g., MapBiomas and SAD can do this well and provide alerts in real time and for the time being governmental data are also of sufficient quality.

Conclusion: in Brazil there are sufficient data sources for the EU to use to monitor deforestation across the country.

Globally, despite recent improvements, there are still gaps in the availability of robust data on commodity driven deforestation. This is caused inter alia by the problem of classifying remotely sensed imagery into production locations. See also point 3 below. Data quality and coverage varies across countries and commodities, and approaches and datasets are often fragmented with different time series, classifications, and geographic scope.

8.3. Human rights violations data, including land tenure and forced labour

Data coverage of human rights impacts, and social risks are more poorly understood and mapped than deforestation data although there is a lot of data available here too.

Land tenure data and conflicts
As agricultural land claims often overlap with Indigenous or tribal peoples’ customary land, land tenure conflicts are rife. Lack of titling and demarcation opens the door to incursion, often violent, for agriculture, timber extraction and mining. This is specifically the case in the Amazon, with 60 per cent of land conflicts and 84 per cent of murders, but more recent expansion of intensive agriculture in the Cerrado has also led to conflict. As much of the forest land in Brazil is not registered nor delimited it is subject to occupation as a means of taking possession, leading to further conflicts.

There are several different datasets in Brazil, documenting land tenure and one database documenting land conflicts. There are also academic and other initiatives that overlay CAR and deforestation data with Indigenous territories and protected areas, e.g., the TerraBrasilis dashboard. There is, however, as yet no single one-stop online database to cross reference agricultural expansion with land use conflicts. Although it would be possible to indicate the presence of reported conflicts in most areas, including scale, duration etc., this would be a major undertaking and would have to be pursued in stages, possibly starting with hotspots that have been the objective of judicial battles.

Conclusion: although there is a lot of data on tenure rights and, in many cases, it should be possible to assess whether a specific land area is either owned or claimed by Indigenous or tribal communities as well as whether there are land conflicts in that area, several searches into different databases would be required and not many data are geo located making using them more difficult.

Forced labour and child labour
Concerning forced labour, and child labour - specifically rampant in the livestock sector with more than half of all registered cases of forced labour - there is one database on forced labour that everyone uses, which is the government’s Radar SIT - Statistics and Information Dashboard of Labour Inspection in Brazil

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121 - The INCRA national public database is the official site of certified properties (detailing 116.6 million ha in Indigenous reserves and 2.9 million ha in Quilombolas territories) which is also used by the Imflora Atlas Agropecuário. There is also an (official) FUNAI database consistent with the data from INCRA (http://www.funai.gov.br/index.php/indios-no-brasil/terras-indigenas). This database has a georeferenced map: http://www.funai.gov.br/arquivos/contenudo/cggeo/pdf/terra_indigena.pdf available also for download in SHAPE format for cross-referencing with other databases. ISA has also a georeferenced system of Indigenous lands in the various stages of demarcation.

122 - There is also a report by the entity WALK FREE regarding its Global Slavery Index for Brazil. There is information on the site providing data from a 2018 survey for the G20 to be used as a basis for import decisions. https://www.globalslaveryindex.org/2018/findings/country-studies/brazil/
There is also a Registry of Offending Employers, known as the dirty list, which has been relatively effective as a deterrent against labour conditions analogous to slavery, notably because being on the list means losing access to bank financing and being exposed to public scrutiny (naming and shaming). The GEFM (Special Mobile Inspection Group of the Secretary of Labour) also developed a phone-in platform for complaints related to forced labour and a platform with data on reports of where forced labour has been observed. The platform lists the municipality where the complaint occurred, including the address of the offending property which can then be located in the INCRA database or in Google Maps.

The CPT’s ‘Slave Labour Data Synthesis Platform’, the oldest and most complete database lists municipalities and place names of locales or properties where the complaint occurred or about which a dispute exists, which can then be located. Last, inPACTO has developed a ‘vulnerability index’ to allow companies to assess risks concerning forced labour. This index is reported on a state and municipal scale only. The municipal list is only open to inPACTO members.

The EU itself has given specific prominence to child labour, with the European Commission President calling for zero tolerance for child labour in her political guidelines for the new Commission. In Brazil, the coverage of child labour is not as good as forced labour because of the ambiguous status of on-farm child labour. There is no “dirty list” for court proceedings regarding child labour but the Observatory (Lab) that reports statistics related to child labour provides information from IBGE at a municipal level as to whether there is a local instance that keeps track of child labour (Yes/No).

Conclusion: there is one database on slave labour that everybody uses and there is the dirty list of companies caught with incidence of forced labour, as well as various other information sources. For an EU company to assess whether there is forced labour in the supply chain is therefore possible. Child labour is more difficult to pinpoint due to lack of information.

Globally data reporting human rights violations or social risks are difficult to find. In many countries, data come from investigative reports by civil society or ‘whistle blowing’.

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

Being able to link deforestation or human rights violations with the commodities produced is critical for the regulation to be enforceable. One 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 totally different than the user of the land, who could be a “laranja” at the owner’s bidding to avoid identification.

The CAR provides an imperfect starting point of ownership and land use data. It’s imperfect, first because the CAR depends on self declaration, meaning it could include fraudulent claims; second because a large part of Brazil is not covered by the CAR; and third, due to the existence of considerable overlap and double counting in CAR registries. Nonetheless it is a start.

In Brazil, the MPF is now chiefly concerned with knowing where the deforestation has taken place and cross referencing this with the CAR (declared title owner). Others, like GFW, are mapping soy terminals and soy cropfields. Again, others are tracing interlocking ownership structures, subsidiaries, and joint ventures with Brazilian “laranjas” over corporate land going back to original investors.
There are also data and satellite imagery showing forest reserves, area in pasture and/or crops, required protection along streams, but not how many cattle are there or what kind of housing, storage or equipment.

As Trase points out, decent production data are difficult to get. National level data are often available but to know the volumes from specific places (farms, municipalities) is difficult to establish for many commodities. More detailed pasture and crop maps would therefore be helpful. Outside of Brazil in the Chaco, estimates of pasture area were recently scaled down from 10 million ha to 5 million ha in part because it turned out to be difficult to distinguish between pasture and shrublands.

Hence, it would be possible to roughly calculate cropland from the areas covered and estimate head of cattle based on average stocking rates in the area but depending on input data, this is not very solid.

Conclusion: in Brazil, although deforestation data are widely available and data on human rights violations and possible land tenure violations are possible to compile, linking these data with localised production of forest risk commodities is more difficult. Estimates of production per area can be made and ongoing research may improve the current situation, but directly linking deforestation to land use and hence concessionaires/landowners is not always simple.

Globally the coverage of commodity production (crops, pasture, plantations) regions is in most places 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, may make it easier to link a commodity to its location of origin. Detailed mapping as done by Starling and others may also be helpful, but these data are not publicly available.
8.5. Supply chain data

Once the 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 therefore must know its full supply chain to be able to assess and mitigate any environmental or human rights risks.

This would include mapping all suppliers (names and locations) and known sourcing facilities and being 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 linking the SISBOV system, GTA data and municipal origin data provided at slaughterhouse level by SIF (federal inspection service) provide options to map cattle movements and link slaughterhouses back to farm level.

As stated by the Accountability Framework Initiative’s Operational Guidance:
To ensure that origins of materials in supply chains are sufficiently known or controlled, buyers at any stage of the supply chain must institute a sufficient level of traceability through one or more of the following methods:

1) Tracing materials back to the production or processing units of origin;

2) Tracing materials back to an intermediate supplier that itself has effective control mechanisms in place to ensure that its supplies are traced to the production or processing units of origin, and can provide sufficient evidence of this to the buyer;

3) Utilising credible assurance systems (e.g., credible certification systems) capable of linking raw material supplies with production units having specific compliance or performance attributes;

4) Tracing materials to jurisdictions or landscapes where it has been demonstrated that performance regarding specific social or environmental issue(s) is adequate to fulfil the buyer’s commitments on the corresponding issue(s).

This is complicated for companies with long supply chains and/or with many indirect suppliers, or those buying on the spot market, 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, cacao and palm oil.

Transparency platforms such as Trase use publicly available data to map soy and cattle exports back to their most likely municipalities of origin based on tax data, logistics data and production data.

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 (e.g., Port of Itaqui in Maranhão). For some countries, like the US, these data are available if you pay. The EU, however, does not publish detailed customs or import data.

It is important to note that 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.
For Brazil, Trase has aggregated per shipment data of all Brazilian soy exports for five years; others have partial data. Globally, the current information landscape on supply chain transparency and traceability is heavily fragmented and not easily accessible.

Conclusion: 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 trade the commodity back to the source. Concerning meat, customs data have a tax code that can be linked back to the slaughterhouse. Company disclosure is important unless you go for jurisdictional approaches, in which case isotope testing may be helpful to prove that a commodity comes from a specific jurisdiction.

8.6. Caveats and limitations about the data sets

Whose data?
Experiences with implementing the EU Timber Regulation, the oldest due diligence regulation in the EU, has shown that for effective implementation, depending on producer country government or company data is not a good idea. These data are either non-existent, difficult to get access to from the EU, or can easily be falsified.

For the EU regulation to be effectively implemented requires EU competent authorities to have access to data that are 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 to the extent the coverage permits are (still) reliable but incomplete; land tenure data is likewise notoriously incomplete, overlapping, corrupt and difficult to sort out. For the EU to assess which other data sources, including scientific data, that can be applied in the EU, e.g., isotope testing, may be important.

What data won’t track
As clearly documented previously in this paper, 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 effects of knock on deforestation through [several] pathways. These include:

i) 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 soy expansion into areas previously occupied by cattle or into the Cerrado

ii) 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

iii) deregulation of environmental and land use safeguards including Indigenous territories to permit greater production for export markets (Imazon, 2020).
Furthermore, in relation to beef, to date, most exporters only trace cattle to the last place before slaughter, the “direct supplier” which may be on pasture, or in a feedlot. But the cattle cycle in Brazil typically includes three stages: cow-calf, stocker and feedlot, often in different places with the first stages, typically representing an important source (over 40 per cent) of deforestation in the chain (Barreto et al. 2017). Also, for other commodities e.g., soy, indirect suppliers and/or soy bought at port or on the spot market, are difficult to monitor and trace.

Another serious problem is “cattle laundering”, in which animals raised in areas interdicted due to deforestation that would be detected by buyers with monitoring systems in place are moved to ranches which have not been so interdicted for the next stage (stocker) prior to transfer to the direct producer and thence to the slaughterhouse to “clean” the supply chain. Such transfers may only be on paper “to enable cattle sales by masking its real source” (Campos and Locatelli 2021).

Cut off dates
Assuming the legislation goes for a cut-off date, 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.

But for all commodities from all countries a cut-off date in the past is important because there is a substantial delay between the point at which a forest is cleared and the point at which the commodities are exported to the EU. For palm oil, for example, it takes at least four years for the palm trees to mature and begin producing fruit.125 Where forest is cleared for cattle grazing, it takes time for the cleared land to grow sufficient grass to feed cattle, plus at least 1.5 years to rear and fatten a cow. Trase assumes a five-year period in Brazil as an average for land to be made productive for soy and cattle.

These time delays are an absolute minimum and the gap between deforestation and trade in resultant commodities is often much longer, not only because there is often a significant delay before cleared land is brought into use, which often takes years. A cut-off date of 2020 would therefore have zero effect for most countries and commodities until five or more years later.

It must be acknowledged that while earlier cases of deforestation cannot be prevented post-facto, allowing continued imports from such cases, especially where those cases were illegal and involved abuses of local community rights, will serve to both help fund fresh clearances by those responsible and to prevent restitution of past cases (including reforestation and compensation).

8.7. Existing EU Forest Information Systems and Observatories

The EU has several observatories, including a climate and health observatory, a bio-economy observatory as well as several forest information systems although these are currently mainly for European forests.

The EU’s Copernicus satellite system is already widely used by various forest monitoring data systems, including Starling high resolution imagery and could be used by the EU itself to monitor changes in land use and deforestation. It is, however, not the raw data but the interpretation of the data that is the more time-consuming element and how to link these deforestation data with land use, tenure and trade data.

The new element for the forest observatory is not the focus on monitoring and measuring changes in the world’s forest cover, but monitoring ‘the associated drivers’ of forest loss and forest degradation. Although whether or to what extent these drivers will go beyond direct trade relations and include socioeconomic drivers, as well as e.g., infrastructure proximity and registry of fire points is unclear.

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125 https://goldenagri.com.sg/oil-palm-grown/#:~:text=It%20takes%20about%20four%20years,to%20around%2040%20feet%20tall.
**The EU’s Forest Information System for Europe (FISE)**

FISE is meant to be an entry point for sharing information with the forest community on Europe’s forest environment. FISE brings together data, information and knowledge gathered or derived through key forest-related policy drivers. It is a partnership between the European Commission (specifically DG-ENV, DG-JRC, Eurostat) and the European Environment Agency (EEA).

It is part of what is called the ‘Landscape of European Data Infrastructures’ and links with other global and European forest portals supporting forest-related policy reporting: FAO-FRA (Food and Agriculture Organisation of the United Nations-Global Forest Resources Assessments), UNECE (United Nations Economic Commission for Europe), Forest Europe, EUFORGEN (European Forest Genetic Resources Programme), ICP-Forests (International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests), Global Forest Watch (GFW), and the EFI (European Forest Institute).

A FISE prototype is still under development but some parts are operational, e.g., European Forest Fire Information System (EFFIS) or FOREMATIS (on Forest Reproductive Material). Forest data harmonisation, inter alia to contribute to international processes such as the data collection for the Forest Europe SFM indicators, still requires significant work.

FISE obviously is focused on Europe’s forests while the proposed Forest Observatory will focus on European forests as well as forests globally. It would therefore be logical to think that FISE would be part of/ included in the EU Forest Observatory’s proposed ‘single web based online platform’ and that the proposed tasks for the EU’s Forest Observatory would not only look at forests globally but also at EU forests.

**EU Forest Observatory proposed tasks:**

1. Monitoring changes in forest cover and forest degradation in the EU and globally;
2. Monitoring consumption of commodities and products possibly associated with deforestation and forest degradation;
3. An early warning system on changes in forest cover related to consumption of commodities and products.

It is well known that EU forests are in a bad ecological state. Non sustainable forest management, intensification measures, the drainage of peatlands and wet forest, fertilisation and forest-tree genetic ‘improvement’ all have had a particularly negative effect on the biodiversity values of forests. Whilst wood harvesting in the EU may be economically sustainable, it is not from an ecological perspective with deadwood (which is a key indicator for forest biodiversity and the conservation value of a forest) being well below optimal levels.

It is advisable for the EU to also look at EU forests when monitoring changes in forest cover and specifically forest degradation and when monitoring the consumption of commodities and products associated with deforestation and forest degradation and in creating an early warning system on changes in forest cover related to consumption of commodities and products.
A European Climate and Health Observatory

The European Climate and Health Observatory (‘Observatory’) is a partnership between the European Commission, the European Environment Agency (EEA) and several other organisations. The Observatory is maintained by the EEA as part of the European Climate Adaptation Platform (Climate-ADAPT) with the support of the European Topic Centre on Climate Change Impacts, Vulnerability and Adaptation (ETC/CCA).

The European Climate and Health Observatory covers 38 countries (EEA member and cooperating countries) and aims to support Europe in preparing for and adapting to the impacts of climate change on human health by providing access to relevant information and tools. It also fosters information exchange and cooperation between relevant international, European, national, and non-governmental actors. It provides access to the following types of information related to climate and human health in Europe: European and national policy context; Impacts of climate change on health in Europe; Indicators on climate and health; Information systems and tools on climate and health; Early warning systems on climate and health. Users are invited to propose relevant items (e.g., new publications) for inclusion in the Observatory’s Resource Catalogue.

The European Climate and Health Observatory intends to publish an annual report on climate change and health in Europe. A pilot version of the European Climate and Health Observatory has been launched in early 2021 jointly with the adoption of a new EU strategy on adaptation to climate change. The Observatory is being developed further in cooperation with its partners and European countries.

It is not quite clear whether or how this Observatory or lessons learned from its creation provide for the creation of the Forest Observatory.

The EU bioeconomy observatory

Following a study ‘Bio-economy and sustainability: a potential contribution to the Bio-economy Observatory’ the Joint Research Centre with DG Research, was made responsible in March 2013 for establishing the Bioeconomy Observatory, bringing together and aligning data, information, indicators, modelling and forward-looking tools to regularly assess the progress and impact of the bioeconomy.

Its aim is to provide regular analysis and data to help policy makers and stakeholders to monitor the development of the bioeconomy and to guide the implementation of the European Bioeconomy Strategy and specifically to get data about the three key pillars highlighted in the Strategy: 1. Investments in Research, Innovation and Skills (research pillar); 2. Reinforced policy interaction and stakeholder engagement (policy pillar); and 3. Enhancement of markets and competitiveness in Bioeconomy (markets pillar), which will bring together and align data, information, indicators, modelling and forward-looking tools to regularly assess the progress and impact of the bioeconomy.

9. Conclusions and recommendations

Brazil has a lot of monitoring systems relating 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’.

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

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 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.
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 code 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 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: Katie Maehler/Mídia NINJA. The team from Brigada Amazônia travel around Acre to show how preserving the forest helps people live and sustain themselves.
References


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.


Annex 1: List of Interviewees

**AATR, Salvador, Bahia (March 2, 2021)**
Maurício Correia Silva - Coordenador de Programas da Associação de Advogados de Trabalhadores Rurais no Estado da Bahia - AATR
Felipe Estrela – Professor de Direito e Presidente da AATR

**Canope (March 2, 2021)**
Klervi Leguenic

**CPT/Campanha Nacional de Defesa do Cerrado, Bahia and Goiás (March 5, 2021)**
Valéria Pereira, Coordinator, Campanha Nacional em Defesa do Cerrado
Guiomar Germani, Professor, Federal University of Bahia, collaborator CPT
Leila Cristina Lemes, CPT, Goiás

**Earthworm Brazil (March 2, 2021)**
Dov Rosenmann, Director
Carolina Graça, Associate

**Earthworm France (March 1, 2021)**
Fabian Girard

**Earthworm Switzerland (March 1, 2021)**
Rob McWilliam

**Federal University of Minas Gerais, Laboratory for the Study of Environmental Services (LAGESA), Belo Horizonte (Feb. 24, 2021)**
Raoni Rajão, Professor and Coordinator

**Graduate Social Science Programme in Development, Agriculture and Society (CPDA/UFRRJ), Rio de Janeiro (March 9, 2019)**
Sergio Pereira Leite, Professor, Coordinator of Study Group on Social Change, Agribusiness and Public Policy (GEMAP)
Georges Flexor, Professor, member GEMAP
Karina Kato, Professor, member GEMAP

**Human Rights Watch, New York City (March 16, 2021)**
Luciana Tellez-Chavez, Researcher, Environment and Human Rights
Andrea Carvalho, Senior Research Assistant, Environment and Human Rights, Americas

**Imaflora – Institute of Forest and Agricultural Management and Certification (March 4, 2021)**
Isabel Garcia Drigo, Manager Climate and Agriculture Supply Chain Initiative
Leonardo Martin Sobral, Manager of Forest Certification
Lisandro Inakake de Souza, Technical Lead, Climate and Agricultural Supply Chains

**Instituto Escolhas, São Paulo (March 25, 2021)**
Sergio Leitão, Executive Director
Jaqueline Ferreira, Projects Director
Instituto de Pesquisa Ambiental da Amazônia - IPAM, Brasília (March 11, 2021)
Martha Fellows Dourado, Researcher-Indigenous Studies
Daniel Bergamo, Research Analyst-Comércio e Ambiente
Olivia Zerbini Benin, Research Analyst-Comércio e Ambiente

Mighty Earth (March 8, 2021)
Etelle Higonet

Ministério Público Federal, Cuiabá, Mato Grosso (April 23, 2021)
Eric Masson, Public Prosecutor

National Wildlife Federation (March 12, 2021)
Nathalie Walker, Director, Tropical Forest and Agriculture Programme
Simon Hall, Manager, Tropical Forest and Agriculture Programme
Francisco Beduschi, Sustainable Agribusiness Specialist
Lisa Rausch, Gibbs Lab, University of Wisconsin

Rainforest Foundation, Norway (March 9, 2021)
Fernando Baptista, Senior advisor, Brazil Program

The Nature Conservancy (TNC), Brazil (March 9, 2021)
José Otávio Passos, Director, Amazon Systems Change Hub, Belém
Caroline Holtz Rolim, Coordinator, Sustainable Soy

Profundo (April 26, 2021)
Barbara Kruedner

Trase (April 27, 2021)
Helen Bellfield
Annex 2. Key events in the rollback of environmental legislation during 2019-20 by the Bolsonaro administration

- Drastic reduction of civil society and municipal seats on the National Environmental Council, (CONAMA) with the majority of the 23 remaining seats now controlled by federal ministries;

- Elimination of a significant number of participatory environmental management bodies, such as the Amazon Fund’s Guidance Committee (COFA) that included NGOs and social movements, as well as the Brazilian Forum for Climate Change (FBMC), the Commission and National Plan for Restoration of Native Vegetation (Planaveg and Conaveg), the National Biodiversity Commission (Conabio) and the National Forest Commission (Conaflor);

- Key environmental responsibilities (e.g., Forestry Service, water resource management) are transferred to Agriculture (MAPA) or Regional Development;

- Indigenous land demarcation was transferred to the Agriculture Ministry; demarcation of Indigenous lands in progress are suspended and a review initiated of those concluded;

- All contracts with NGOs were placed under scrutiny by the Minister of the Environment, blocking release of funds, and relations with Norway and Germany are strained after questioning of Amazon Fund project approvals, resulting in paralysis of the Fund’s operations; government later proposes to use the fund to indemnify properties in protected areas;

- Government declares intent to permit mining and petroleum exploration in Indigenous lands and later introduces legislation (currently under consideration in Congress) to that effect; invasions in Indigenous territories increase significantly;

- Creation of an administrative authority for conciliation of environmental fines, which aims to reduce, convert or eliminate such fines; payment of fines declines to lowest level in a decade; Ministry is permitted to negotiate and convert fines to fund other actions;

- Functionaries of the federal environmental agency IBAMA, the protected lands agency ICMBio and the deforestation monitoring centre INPE are exonerated and replaced by military officials;

- Data generated by INPE are discredited as having been manipulated by NGOs, and government procures private services to monitor deforestation; INPE is restructured and funding reduced;

- Minister of the Environment determines to review protected areas created under previous administrations, and reduces budgets of both IBAMA and ICMBio;

- Government mounts military operation to repress burning and illegal deforestation with little effective reduction in such activities; substantial areas of the Pantanal biome burn uncontrolled;

- Government enacts provisional measure to allow titling of public lands to occupants (known as the “land-grabbing” bill; currently in consideration for enactment by the Congress);

- Exports of native timbers are liberated by IBAMA without need for examination of the regularity of origin.

Source: (Associação Nacional dos Servidores de Meio Ambiente (ASCEMA) 2021)
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.

"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."