



LATIN AMERICA'S ENVIRONMENTAL POLICIES IN GLOBAL PERSPECTIVE

This series explores the international dimensions of Latin America's environmental challenges and the role of environmental issues in shaping the region's most important diplomatic and economic relationships.

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Uncovering the Deforestation and Climate Risks of Chinese and EU Soy and Beef Imports from South America

By André Vasconcelos

AGRICULTURAL COMMODITIES AND DEFORESTATION INTRODUCTION

At the United Nations (UN) Climate Change Conference (COP26) in Glasgow, Scotland, in November 2021, over 130 countries ramped up their commitments and pledged to work collectively to end deforestation by 2030 under the Glasgow Leaders' Declaration on Forests and Land Use.¹

Deforestation is the second largest source of greenhouse gas (GHG) emissions caused by human activity and leads to significant biodiversity loss, climate

change, and other environmental challenges.² When trees are cut down, burned, or left to rot, their stored carbon is released into the atmosphere. Research shows that 29 to 39 percent of tropical deforestation-related carbon emissions have been driven by international trade of agricultural commodities, particularly beef and oilseed exports.³

In addition to contributing to the increase in GHG emissions, tropical deforestation affects rainfall patterns and increases local temperatures, putting the productivity of agricultural commodities at risk.⁴ Widespread deforestation also undermines the goals

Photo credit: Soy plantation in Brazil: Guilherme Spengler, Shutterstock

of the Paris Agreement on climate change and the UN Convention on Biological Diversity.

The need to decouple deforestation from global supply chains is now widely recognized by the governments of consumer and producer countries (e.g., the Amsterdam Declarations Partnership and New York Declaration on Forests), global companies (e.g., Consumer Goods Forum), and different actors across value chains,⁵ as climate risks and deforestation are starting to be factored into core trade agreements.

Two production systems, cattle (for beef and leather) and soy (for grain, oil, and cake), are associated with the majority of deforestation and GHG emissions from agricultural expansion and land-use change in South America. Pasture is by far the main land use that occupies land within five years of its original clearance. In 2018, around 80 percent of deforested areas in the Brazilian Amazon was for pasture,⁶ and almost all the direct deforestation in the Chaco in Paraguay was driven by pasture expansion.⁷

Soybean production has also driven large amounts of vegetation clearance in the Brazilian Cerrado,⁸ the world's most biodiverse savannah, and is indirectly linked to deforestation via the displacement of pasturelands in the Amazon, Cerrado, and Chaco. Analysis by Trase (see Box 1) found that for every hectare of soybean expansion into pasture in the Brazilian Amazon and Cerrado, there was at least one hectare of pasture expansion onto native vegetation.⁹

As the largest importers of soy and beef worldwide, the European Union (EU) and China play a critical role in the supply chains of these commodities. Both have the power to accelerate the sustainability agenda and influence the way these commodities are produced and traded.

Building on Trase data, this brief seeks to provide the best available information on the deforestation associated with China's and the EU's soy and beef imports from South America, with a focus on Brazil,

Argentina, and Paraguay. By bringing more clarity into how soy and beef exports are linked to deforestation and carbon emissions, Chinese and EU governments and business analysts will be able to assess their impacts and identify opportunities for transitioning toward more sustainable commodity supply chains.

Box 1: What Is Trase?

Trase is a data-driven transparency initiative that is revolutionizing our understanding of the trade and financing of the commodities driving deforestation worldwide. Its unique supply chain mapping approach brings together disparate, publicly available data to connect consumer markets to deforestation and other impacts on the ground. Trase's free online tools and actionable intelligence enable companies, financial institutions, governments, and civil society organizations to take practical steps to address deforestation.

Trase data is obtained by combining key information (e.g., trade data, tax information, infrastructure ownership) to construct spatially explicit commodity supply chain maps that link localities of production (e.g., municipality, department) and traders to importing countries. This supply chain information is then combined with data on sustainability indicators gathered at the local level, such as commodity production, deforestation, and CO2 emissions from land-use change. Deforestation data is generally obtained from either official data from local governments (e.g., INPE-PRODES in Brazil), nongovernmental organizations (e.g., SOS Mata Atlântica, WWF), or peer-reviewed research led by academic partners (e.g., Humboldt-Universität zu Berlin, University of Maryland GLAD). Trase data, sources, and methods used for deriving supply chain maps and commodity deforestation are available at trase.earth/resources.

CHINA AND THE EU ARE THE CONSUMER MARKETS MOST EXPOSED TO DEFORESTATION

According to data collected by Florence Pendrill et al.,¹⁰ the international trade of agricultural commodities was associated with 1.3 million hectares (ha) of tropical deforestation in 2017, an area 10 times the size of New York City. China and the EU were linked to 40 percent of the global tropical deforestation associated with agricultural commodity trade, representing 305,000 and 202,000 ha of tropical deforestation in 2017, respectively. Over half of this tropical deforestation was associated with agricultural commodity imports from South America, followed by imports from Indonesia (29 percent of the total).

Tropical deforestation associated with the trade of agricultural commodities from South America is highly concentrated in a few products and producer countries. Over three-quarters (77 percent) of China's trade-related deforestation was linked to soy and beef products from Brazil (Figure 1). In the case of the EU, 76 percent of its trade-related deforestation was linked to soy products from Brazil and Paraguay and beef and wood products from Brazil (Figure 1).

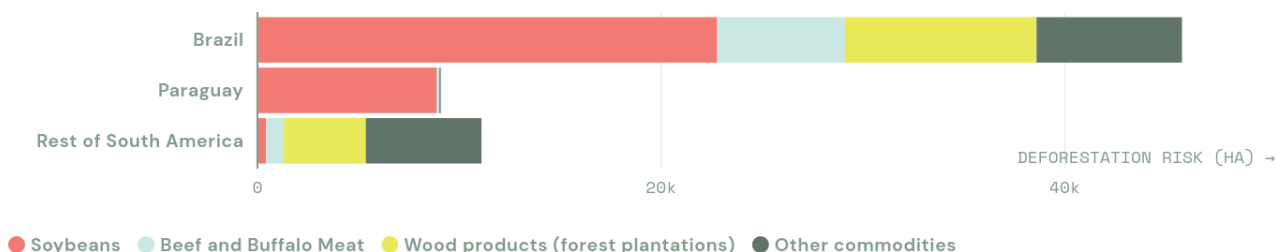
THE CASE OF SOY

China¹¹ and the EU are the largest consumer markets for South American¹² soy products by far, accounting for 55 percent (71.7 million tons) and 16 percent (20.6 million tons), respectively, of overseas exports in 2018. Soy is an important ingredient and provider

Figure 1. Tropical deforestation associated with the EU's and China's imports of agricultural products from South America in 2017 (by product and country of origin).

EU Imports from South America

Associated Deforestation Risk by Commodity and Country of Export (2017)



China Imports from South America

Associated Deforestation Risk by Commodity and Country of Export (2017)



Data Source: Florence Pendrill, U. Martin Persson & Thomas Kastner (2020). 'Deforestation risk embodied in production and consumption of agricultural and forestry commodities 2005-2017'. Chalmers University of Technology, Senckenberg Society for Nature Research, SEI, and Ceres Inc. DOI: 10.5281/zenodo.4250532 CC BY 4.0

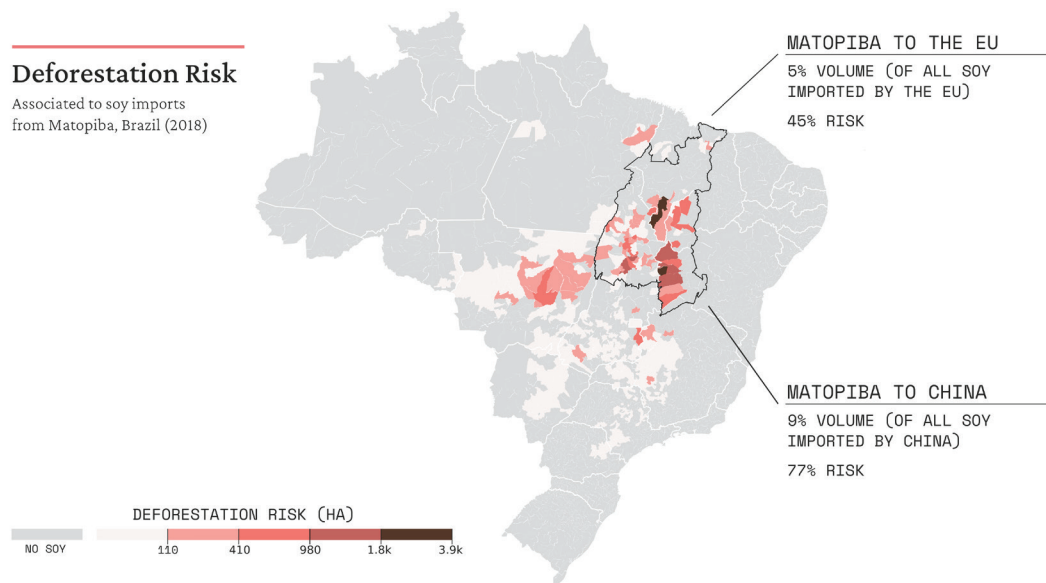
of protein content for animal feed, with the majority of these imports in both consumer markets going to feed livestock, especially pork and poultry.

Looking specifically at Brazilian soy, the region known as Matopiba, which is the main agricultural frontier in the Brazilian Cerrado, was responsible for almost 75 percent of the total deforestation linked to soy exports from Brazil. Carbon emissions per ton of soy

exports from Matopiba in 2018 were six times higher than the national average (0.59 carbon dioxide equivalent per ton of soy).¹³

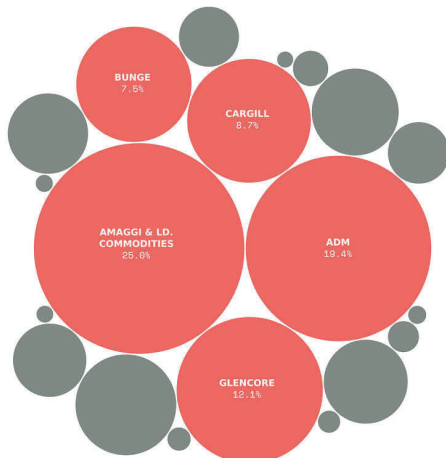
While in 2018, only around 9 percent (6.1 million tons) of China's soy imports from Brazil, Argentina, and Paraguay came from Matopiba, the region accounted for 77 percent, or 26,725 ha, of all the deforestation associated with China's soy imports

Figure 2. China's and the EU's deforestation associated with soy imports from Brazil is highly concentrated in the Matopiba region (highlighted on the map). Bubble charts represent the export companies and their respective volumes of soy exported from Matopiba to China and the EU.



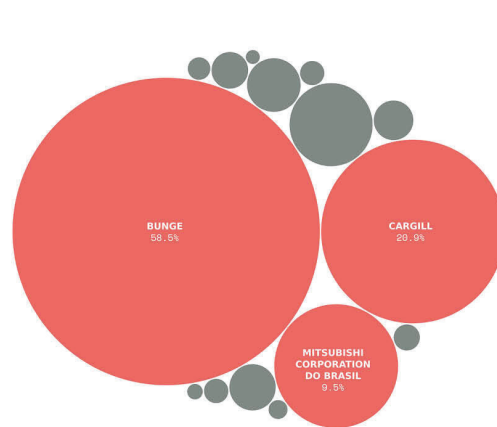
China Soy Imports from Matopiba – By Company

Volume Percentage by Exporting Company (2018)



EU Soy Imports from Matopiba – By Company

Volume Percentage by Exporting Company (2018)



(Figure 2). Similarly, the 5 percent (915,600 tons) of the EU's soy imports from South America sourced in Matopiba accounted for at least 45 percent (3,828 ha) of the deforestation associated with its soy imports (Figure 2).

A recent study estimates that almost 90 percent of the deforestation in Matopiba is likely to be illegal due to the lack of deforestation permits.¹⁴ This means that China and the EU are at risk of supply chain disruption, as soy that is grown on farms where illegal deforestation has taken place could be embargoed through law enforcement.

THE CASE OF BEEF

South America is also an important supplier of beef for the EU and China. Using resources trade data, I calculated that Brazil was responsible for providing over a third of China's and 18 percent of the EU's beef imports in 2019.¹⁵ Argentina and Uruguay are also relevant sources of beef for China and the EU, but the deforestation related to these exports is small compared to Brazil's beef exports (Figure 1).

According to Trase, Brazil's 2.1 million tons of beef exports around the world in 2017 were linked to 113,000 ha of razed forests and around 37 million tons of deforestation-related CO2 emissions. In 2017, Chinese imports of Brazilian beef were associated with 40,000 ha of deforestation, compared to 5,000 ha for EU imports.

Similar to soy, the deforestation connected with beef exports was highly concentrated in a few localities. More than half of Brazil's beef-export-associated deforestation was concentrated in just 2 percent of cattle-producing municipalities. Trase's data uncovered that only 15 municipalities accounted for over 20 percent of the deforestation associated with Chinese and EU beef imports from Brazil in 2017.

Looking at deforestation in 2020, four out of the top five municipalities with the highest deforestation rates in Brazil were also the top five municipalities where the deforestation associated with soy and beef exports was concentrated.¹⁶ This shows that deforestation in these places continues to happen at high rates, and it is likely that these newly deforested areas will become agricultural lands in the future to meet both domestic and international demand.

Box 2: How Does Trase Assess Deforestation in Commodity Supply Chains?

Trase estimates hectares of deforestation in municipalities in Brazil and departments in Argentina and Paraguay using local data on commodity production, sourcing patterns, and deforestation. This indicator assesses the risk that a commodity imported by any given company or country is associated with deforestation in the producer region.

To estimate commodity deforestation risk for each subnational region of commodity production, Trase estimates the share of local output that each company or importing country buys. Trase then assigns the commodity deforestation in each area in proportion to the volume that each buyer purchases. For example, if a company buys 20 percent of the soy produced in a given municipality, it is assigned 20 percent of the local soy-related deforestation.

It is important to note that deforestation risk estimates the extent to which a commodity buyer (company or country) is exposed to deforestation in its supply chain based on the jurisdiction it is sourcing from. Trase does not directly attribute responsibility for deforestation to specific companies or countries, as data on precise sourcing patterns back to individual farms is not publicly available. For further details, please access www.trase.earth/about/.

ONLY A FEW COMPANIES DOMINATE SOY AND BEEF MARKETS

Hundreds of companies are involved in the export of soy and beef from South America to China and the EU, but a handful of traders dominate the market. At least half of soy exports are concentrated in the hands of five exporters.

The so-called ABCD companies (ADM, Bunge, Cargill, and Louis Dreyfus), along with COFCO International, accounted for 56 percent of the soy trade from Brazil, Argentina, and Paraguay to China in 2018 (40 million tons). The pattern also holds for exports to the EU, with Bunge, Cargill, Louis Dreyfus, Amaggi (a Brazilian trader), and Vicentin (an Argentinian trader) accounting for around 53 percent of the exports (10.8 million tons).

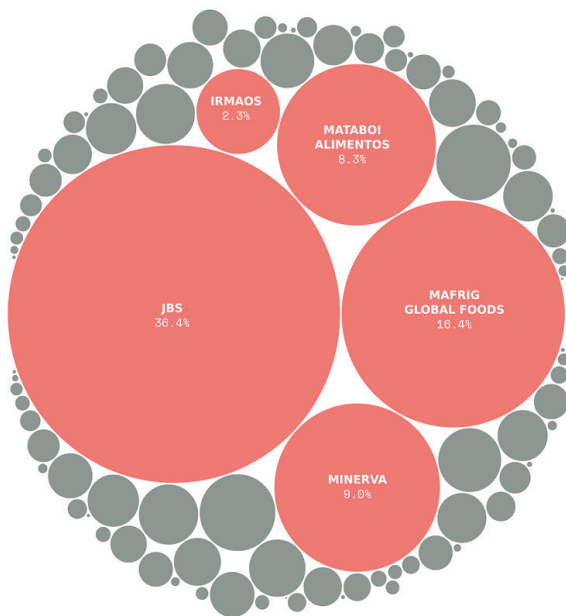
In the case of beef exports from Brazil to China, the dominance is even more apparent. Five companies (JBS, Marfrig Global Foods, Minerva, Mataboi Alimentos, and Irmãos Gonçalves) handled 73 percent of exports in 2017 (556,800 tons). These same companies, with the exception of Irmãos Gonçalves, also play a key role in the trade from Brazil to the EU, accounting for 95 percent of the exports in 2017 (171,800 tons) (Figure 3).

“While corporate commitments are very recent, there is little evidence that they are yet to significantly reduce the deforestation associated with commodity exports.”

Figure 3. Largest beef exporters from Brazil to China and to the EU, and their market share in 2017.

China beef imports from Brazil – By company

Volume percentage by exporting company (2017)



EU beef imports from Brazil – By company

Volume percentage by exporting company (2017)

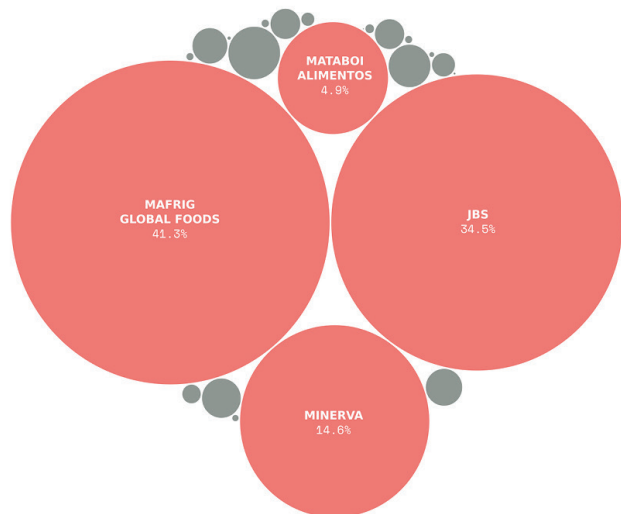




Photo credit: Cattle herd in Paraguay: Jo Gerken, Shutterstock

Some of these companies are already committed to deforestation-free supply chains and have recently published action plans to meet their commitments. In fact, Trase data shows that around 60 percent of the soy exported from Brazil, Argentina, and Paraguay to China and the EU was traded by companies with a zero-deforestation commitment (ZDC).

ZDCs are an important step toward more sustainable trade, but the implementation of these commitments is critical. While corporate commitments are very recent, there is little evidence that they are yet to significantly reduce the deforestation associated with commodity exports.¹⁷ What is encouraging is that Trase supply chain data offers information for companies to understand the deforestation risk they are exposed to via their imports.

EFFORTS TO ADDRESS DEFORESTATION ASSOCIATED WITH IMPORTS IGNORE IMPORTANT ECO- REGIONS

Current efforts to address deforestation driven by soy and cattle expansion are mostly focused on the Amazon biome and ignore other important, highly biodiverse biomes, such as the Cerrado, or eco-regions, such as the Chaco.

Almost 90 percent of soy exports in 2018 (9.1 million tons) and 84 percent of beef exports in 2017 from the Brazilian Amazon (448,300 tons) were covered by some form of voluntary ZDC.¹⁸ In contrast, only 60 percent of soy exports (22.7 million tons) and 20 percent of beef exports (185,200 tons) from the Cerrado were traded by companies with ZDCs. In the Chaco, around 52 percent of soy exports (1.5 million tons) were covered by a ZDC.

The situation is even more critical in the Matopiba region, where the deforestation associated with the EU's and China's soy imports is mostly concentrated. Only 43 percent of soy exports (3.5 million tons) from this region in Brazil was covered by ZDCs.

“These biomes will continue to be under threat if trade policies and regulations focus on specific commodities and regions.”

In addition to the lower coverage by commitments, the national regulations are weaker for these areas than other biomes. In the case of Brazil, only 20 to 35 percent of the native vegetation on a farm located in the Cerrado must be protected under Brazil’s Forest Code, as opposed to 80 percent in the Amazon. In the case of Paraguay, up to 55 percent of native vegetation on a farm located in the Chaco can be legally cleared, as opposed to none on farms located in the Atlantic Forest biome.

These biomes will continue to be under threat if trade policies and regulations focus on specific commodities and regions.¹⁹ Leakage and indirect effects mean that efforts to reduce deforestation in one biome, like the Amazon, or one commodity, like soy, can result in deforestation shifting to other regions (e.g., the Cerrado) and other commodities.²⁰

CONCLUSION

Exports of soy and beef from South America will continue to play an important role in meeting growing demand from China and the EU. However, cattle ranching and soy production in South America remain intrinsically linked to deforestation and related carbon emissions.

At a first glance, it may seem that tackling the deforestation associated with supply chains is very complex and difficult to resolve. Trase data makes it possible to map soy and beef exports to China and the EU back to localities of production. The concentration of deforestation in specific production regions offers a strategic opportunity for Chinese and European buyers to address the immediate problem. Through

concerted actions with their suppliers in the producing countries, soy and beef buyers can target these places to deliver a bigger positive impact through optimizing resources—while building awareness of new deforestation frontiers that may be opening up.

An increasing number of regulatory measures, especially in the EU, are being developed to address deforestation associated with overseas trade, such as the United Kingdom’s Environment Bill²¹ and an EU legal framework.²² These measures are critical to require companies to better understand their deforestation impacts overseas and have systems in place to mitigate these impacts. But it is vital that such regulations are grounded in science and cover all commodities and all regions where these commodities are produced.²³

The disproportional importance of the Chinese and European markets for soy and beef from South America means that actions from both markets can catalyze positive changes in the way these commodities are produced and traded. Tackling environmental impacts associated with soy and beef imports from South America will not only contribute to international climate change and biodiversity goals but also ensure the long-term security of the supply chains.²⁴

Andre Vasconcelos is a senior research associate at Global Canopy and Trase, and a master's candidate in biodiversity, conservation, and management at the University of Oxford. Vasconcelos has over 10 years of experience designing and implementing research and projects on conservation-related issues in different organizations. His current work at Trase focuses on researching the links between deforestation and supply chains, with a particular emphasis on the exposure of Chinese and European markets to deforestation risk and climate impacts.





NOTES

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Woodrow Wilson International Center for Scholars
One Woodrow Wilson Plaza
1300 Pennsylvania Avenue NW
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