


BRAZILIAN AMAZON

The Brazilian Amazon is one of the largest areas of tropical forests at 395 million ha^[1], and provides significant environmental services, including carbon sequestration and some of the world's richest biodiversity^[2]. The southern and eastern portions of the Amazon have faced high pressures in the last four decades. The biome is close to reaching a tipping point, at which the forest will no longer be able to sustain processes such as water recycling, that keep it alive^[2], and the most affected portions will suffer diminished rainfall and prolonged dry seasons^[3].

Drivers of deforestation

Cattle ranching 	Expanding predominantly under extensive and low-production systems, in some cases linked to land speculation that leads to establishment of pasture to justify land ownership ^[5, 6] .
Roads expansion 	Mainly through the paving of main transport corridors ^[7] . Also, the growing network of unofficial roads ^[8] facilitates logging operations followed by active land occupation ^[9] .
Large-scale agriculture 	Commercial agricultural crops tend to expand by taking over pasture lands, but may contribute to deforestation through displacement of ranching for beef production ^[13, 14] .
Smallholder farming 	Linked to the expansion of subsistence and cash crops (e.g. cocoa), and combined with the adoption of cattle ranching in smallholder systems, including agrarian reform settlements ^[10] .
Large-scale logging 	While commercial logging has dropped over time, illegal activities have continued, linked to small-scale logging but also promoted by organized criminal networks ^[11, 12] .
Mining operations 	Large-scale mining has limited direct impacts on deforestation, but may generate waste and affect local livelihoods ^[15] . Illegal gold mining also threatens indigenous lands ^[16] .
Hydroelectric power 	Hydroelectric dams play a significant role in deforestation, not just from the area flooded but by the settlement that they attract – a recent example is the Belo Monte Dam ^[17] . The Bolsonaro administration has signalled its intention to expand dams in the Amazon basin.
Fires 	Used for clearing primary forests and preparing the area for agriculture ^[18] , though fires occur also on already cleared land ^[19] and can get out of control, invading standing forests ^[20] .

- Primary cause of forest loss and/or severe degradation
- Secondary cause of forest loss and/or severe degradation
- Less important cause of forest loss and/or severe degradation

Underlying causes

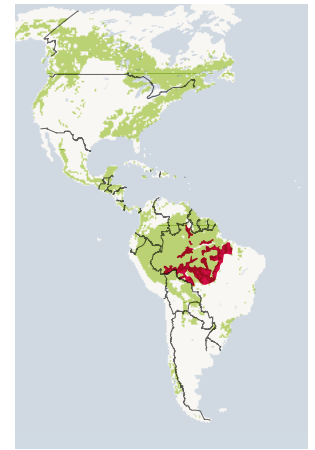
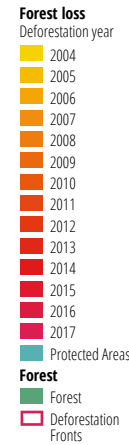
Underlying causes are insecure tenure and land speculation that is also associated with land grabbing or encroachment of public lands, protected areas and indigenous lands^[21]. In addition, large-scale investments in infrastructure and hydroelectrical dams and expansion of logistics for supporting agribusiness development have also prompted land occupation and growing pressure on forestlands^[15]. More recently, relaxed environmental controls^[22, 23] and the national government's support of agribusiness and extractive industries in the Amazon have countered previous governments' perspectives on forest conservation in the Amazon^[24], suggesting that it is no longer a federal government priority.

Countries, region	Brazil, Amazon
Forest type	Humid tropical forests
Total area	118.7Mha
Forest area in 2018	85.9Mha (72.3% of total deforestation front area)
Forest loss 2004-2017	15.5Mha (15.4% of forest area in 2000)
Location of deforestation	Mainly in the south and east ^[4]
Total forest core area in 2018	49.8Mha (58.0% of forests in 2018)
Fragmented forests 2000-2018	11.4Mha (11.4% of forest area in 2000)
Accumulated burned area, 2002-2019	14.2Mha (14.1% of forest area in 2000)
Deforestation trend	Downward trends from 2004 to 2012; upward trends since 2013 but still at a relatively lower rate ^[4] compared to early 2000s
Future trends	Increase in deforestation during 2018 and 2019 suggests that deforestation in the Amazon will follow an upward trend

Responses

Protected areas	Active establishment of a mosaic of protected areas and conservation units (103M ha) intended to protect biodiversity and contain the agricultural frontier expansion ^[1, 25] .
Recognition of IPLCs	Extended recognition of indigenous territories and other traditional tenure rights (115M ha) ^[11] , constituting an important strategy to support local livelihoods and protect forests.
Moratoria	Soy Moratorium (2006) to halt the expansion of soy into forestlands ^[26] , and a cattle agreement (2009) to avoid sourcing beef from deforestation-risk areas ^[27] .
Land-use zoning	Land-use regulations – including a rural environmental registry and reform of the Forest Code – and credit constraints to halt conversion and restore legal forest reserves ^[28] .
Deforestation monitoring	Brazil has developed one of the most reliable systems for monitoring deforestation in the Amazon (INPE) ^[4] , along with an independent system of deforestation alerts (SAD) ^[29] .
Timber legality	Growing investments in enforcement and monitoring of illegal forest clearing ^[30, 31] , but some loopholes in the system still allow for the laundering of illegal timber ^[24] . More recently, there has been a significant weakening of enforcement operations.
REDD+ projects	Several REDD+ projects were established in the Amazon. The Amazon Fund (2008) was created to finance conservation, monitoring and sustainable use projects ^[32] .
Traceability of supply	Main soy traders are tracing their sources of supply to comply with the Soy Moratorium, as are meat-packing groups, but some loopholes persist ^[24] .

- Deployment at wider scale
- Actively used and expanding
- Project-specific, experimental



Main outcomes

The establishment of protected areas and recognition of indigenous rights have proven effective in containing deforestation, securing carbon stocks and protecting biodiversity^[33]. The Soy Moratorium helped halt the expansion of soy in the Amazon biome^[26], yet the cattle agreement has been unable to control indirect suppliers and “cattle laundering” has become a widely adopted practice^[34]. Persisting deforestation has been associated with land speculation and encroachment of public lands^[35]. In the recent past, a gradual weakening of law enforcement has stimulated a growth of illegal activities.

Recommended future actions

- Eliminate land grabbing and land speculation.
- Reduce deforestation on private properties by facilitating payments for environmental services (PES) combined with market initiatives for sustainable sourcing.
- Incentivize increased productivity through targeted investments.
- Provide technical assistance to enhance smallholders’ performance^[36].

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