



POLICY BRIEF

Strengthening Brazil's Forest Protection in a Changing Landscape

As Amazon deforestation shifts to small-scale clearings, policymakers should adapt

Annual deforestation rates in Brazil's Amazon fell by almost 80% between 2004 and 2012 due in large part to conservation policies Brazil introduced in 2004. While this is welcome news to policymakers intent on combating forest clearings, a new challenge has emerged: deforestation now occurs on smaller tracts of land, which is more difficult to detect and remains unaddressed.

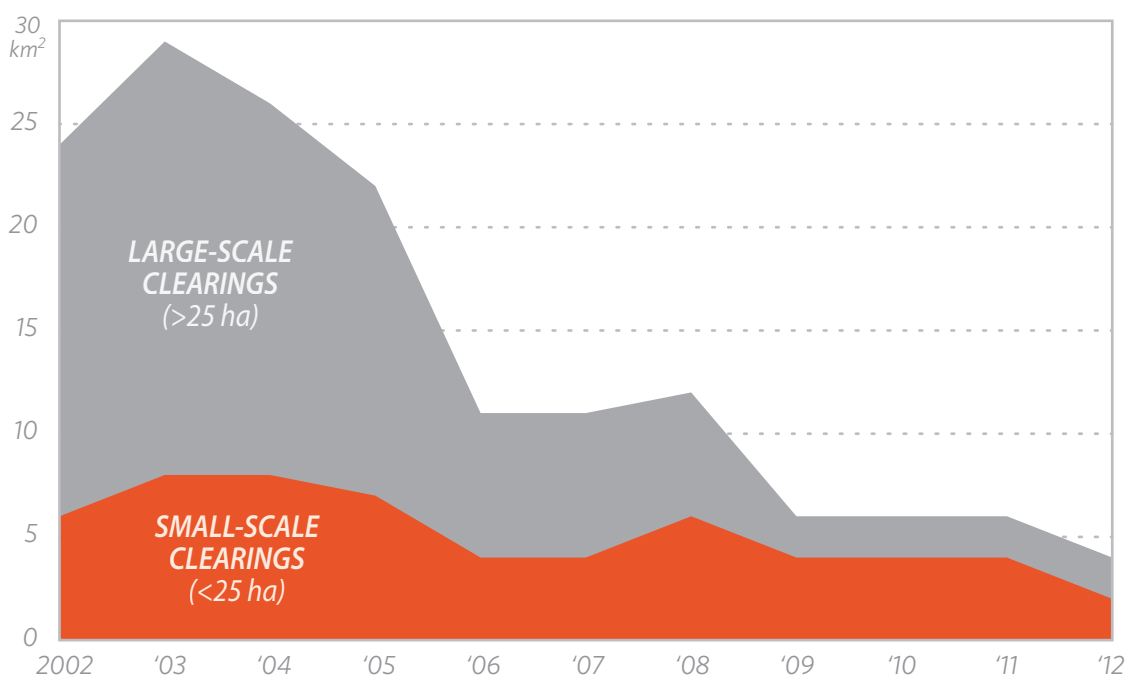
A shift away from large-scale clearings (see Figure 1) raises new questions about what drives deforestation toward smaller-scale tracts. According to insights gained from research conducted by Climate Policy Initiative / PUC-Rio,* regional differences and individual behaviors within those regions hold important implications about how policymakers might adapt.

Researchers looked particularly at deforestation trends and practices in the states of Mato Grosso and Pará and reveal insights that could be applicable throughout the Amazon.

KEY RECOMMENDATIONS

- Create new strategies that target small-scale deforestation and complement the tactics that have proven effective in slowing medium- and large-scale clearings.
- Tailor new policies to locales in order to accommodate regional differences and characteristics.
- Enhance remote sensing-based monitoring technology to detect small-scale clearings.

Figure 1: Brazilian Amazon Annual Deforestation



*[Deforestation Scale and Farm Size: the Need for Tailoring Policy in Brazil](#)

KEY FINDINGS

- Due in part to policies that have helped reduce large-scale deforestation, Amazon deforestation now occurs mostly in small increments. Small-scale deforestation is difficult for the current monitoring system to detect and has grown from a quarter to more than a half of overall annual clearings.
- Small-size property holders (smallholders) in Pará emerged as the leading agents of forest clearings.
- Medium- and large-size property holders in both Mato Grosso and Pará appear to have adapted to the new enforcement by shifting their land clearing practices to smaller areas.
- Differences between states can be in part explained by historical differences in deforestation behavior: in the early 2000s, smallholders in Mato Grosso cleared forest in larger increments, while in Pará they were more likely to be engaged in small-scale deforestation. Smallholders in Pará were therefore more likely to elude the monitoring system.

Analysis For Policymakers

Learning from Regional Differences in Mato Grosso and Pará

Brazilian deforestation rates fell from a high of 27,000 km² in 2004 to 4,500 km² in 2012. The large reduction in deforestation rates can be attributed, in part, to conservation policies Brazil introduced in 2004. These policy efforts included the introduction of a remote sensing-based monitoring and enforcement program, which played a key role in reducing deforestation of large- and medium-scale areas; however, due to a technical limitation, it cannot detect deforestation on a smaller scale. This means that clearings of areas measuring 25 hectares or less – or approximately the size of 15-20 soccer fields – go mostly undetected.

Indeed, as Figure 1 illustrates, CPI/PUC-Rio researchers found that from the early 2000s through the early 2010s, total deforestation of small-scale areas remained constant, but grew as a percentage of overall clearing from a quarter to more than a half.

Deforestation now occurs mainly in small increments (see Figure 2). In addition, when researchers looked at the size of the deforestation efforts on different sizes of property, they found that holders who owned smaller-sized properties, those measuring up to approximately 250-350 hectares, behaved differently than holders of larger properties in some circumstances.

Researchers examined deforestation in the states of Mato Grosso and Pará to gain a deeper understanding of the regional factors affecting deforestation rates.

Deforestation Trends in Mato Grosso

At the beginning of the 2000s, smallholders in Mato Grosso tended to clear their property in medium- and large-scale tracts of land. While smallholder's share of deforestation remained constant over the 2000s (see Figure 3), the share of small-scale clearings increased in the state (see Figure 4). This is because clearings of medium- and large-scale tracts fell inside medium and large properties.

Figure 2: Amazon Deforestation by Size of Land Area Cleared

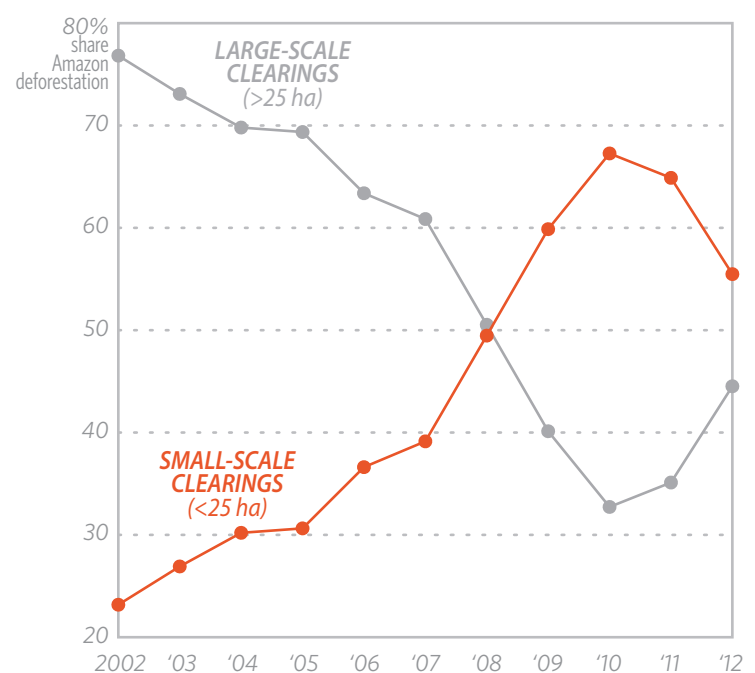
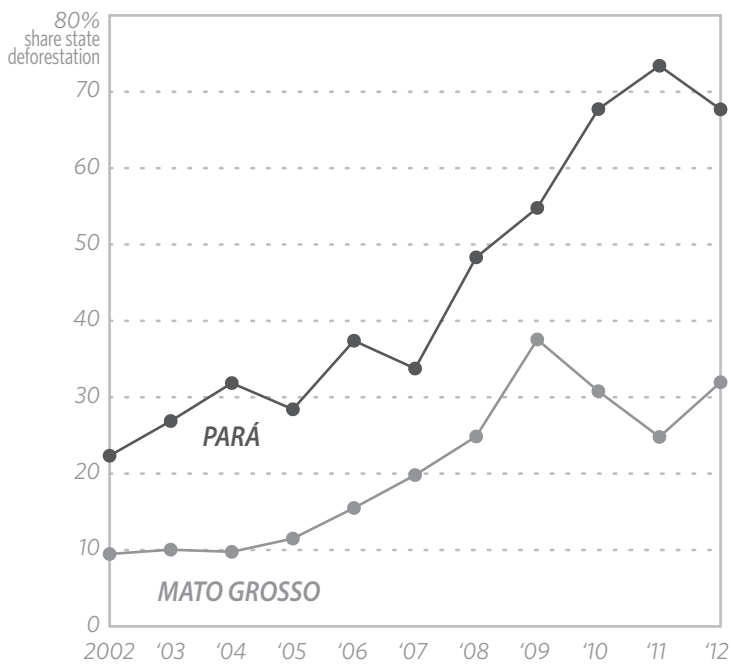


Figure 3: Small-scale Deforestation in Mato Grosso and Pará



Researchers suspect the change in clearing size from medium and large-scale tracts to smaller tracts may be mainly due to the effectiveness of the remote-enforcement program that thwarted clearings larger than 25 hectares. When this type of illegal activity was more easily detected by the monitoring system, and, thus, more effectively contained, property holders in Mato Grosso shifted their deforestation activities to smaller tracts of land to escape detection.

Deforestation Trends in Pará

Although deforestation in Pará shared some similar characteristics with Mato Grosso during this time period, their differences suggest the importance of tailoring policies to locales.

At the beginning of the 2000s, smallholders in Pará were much more engaged in small-scale clearings than in Mato Grosso. Deforestation on small properties remained relatively more persistent in Pará throughout the early 2010s. In addition, the share of small-scale clearing in overall state deforestation increased sharply into the late 2000s, especially when compared to Mato Grosso.

In practice then, Pará landholders were more likely to elude the remote monitoring system because they were much less visible to law-enforcers. This suggests that conservation policies may have been more effective in curbing deforestation in Mato Grosso than Pará.

Medium- and large-scale landholders in Pará may have also responded to the conservation policies, but small-size property holders clearly emerged as the leading agents of forest clearing in that state.

Differences in Property Size and Conservation Policy

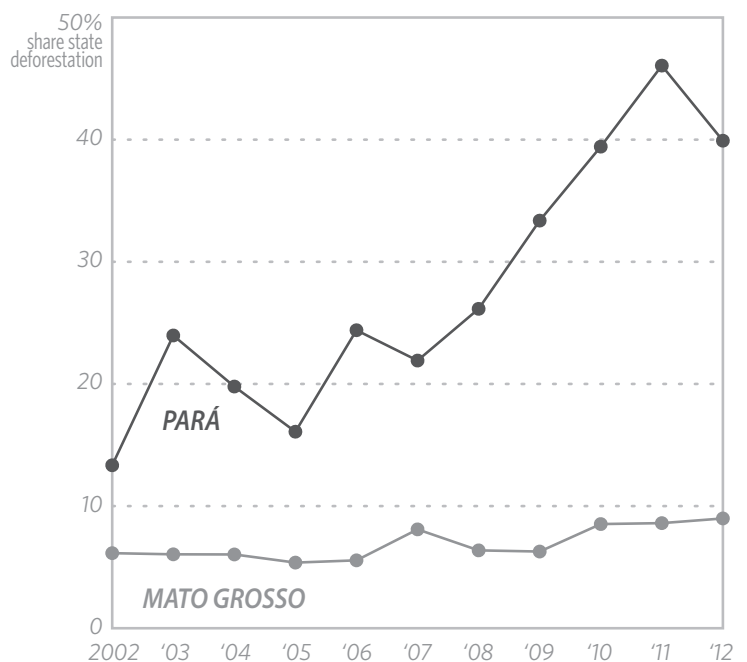
In both states, even smallholders who only deforested in small increments may have reduced deforestation in response to stricter law enforcement in neighboring large areas. This effect was likely stronger in Mato Grosso, where medium and large properties prevail. Furthermore, because the average property size in Mato Grosso is much larger than in Pará, there was probably a greater chance of the monitoring system detecting private property deforestation in Mato Grosso.

Conclusion

Although the researchers emphasize that their data does not identify the underlying reasons for the differences in Mato Grosso and Pará, their work illustrates how landholders behave differently from region to region. Ultimately, it is clear that deforestation can no longer be viewed as a single, homogenous problem across the Amazon.

Rather, clearing activities and landholders differ regionally and even locally. Therefore, policymakers must begin tailoring solutions to address these regional differences and the challenge of small-scale clearings.

Figure 4: Small-Property Deforestation in Mato Grosso and Pará



Notes On Data

Data Sources

Annual deforestation increment from the Project for Monitoring Amazon Deforestation (PRODES) by the National Institute for Space Research (INPE)

Private property perimeters from the Environmental Rural Registry (CAR) and the Unique Environmental License (LAU)

Methodology

The study combines the above property boundary data and georeferenced deforestation data to determine whether deforestation polygons were located inside small, medium, or large properties.

Limitations

Due to data availability, the study focuses on registered private rural properties in Mato Grosso and Pará states. These states accounted for approximately two-thirds of the forest area cleared during the studied time periods. Even if the data is not exhaustive, the sample is relevant.

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About CPI

Climate Policy Initiative (CPI) works to improve the most important energy and land use policies around the world, with a particular focus on finance. We support decision makers through in-depth analysis on what works and what does not. CPI's Brazil program partners with the Pontifical Catholic University of Rio de Janeiro and focuses on a Production and Protection approach to land use.

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