

WHAT HAS CHANGED IN THE AMAZON LOGGING SECTOR IN THE LAST TWO DECADES (1998-2018)?¹

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SUMMARY

In the last 20 years, roundwood production in the Amazon has decreased from 28.3 million cubic meters² to 8.8 million cubic meters. Only in 2018, to sustain this production, we estimate a minimum area of 294-441 thousand hectares² of logged forests. At the same time, the area of forestlands in the Amazon used by the logging industry has been alarmingly evolving. We have observed the concretization of the pessimistic scenario in which this industry, established along the so-called "arc of fire and deforestation" in the 1980s-1990s, moved to the core of the Amazon in the following decades. In 2018, ¾ of production came from northern and northwestern Mato Grosso, northern Rondônia, and western Pará. This fact indicates that, unless stabilized, the Amazonian logging frontier will continue to expand indefinitely, increasing the rates of deforestation, degradation, and conversion of forests to low-productivity agriculture and livestock. However, there is still time for corrective action. Some of the regions included in the new logging frontier, such as southern Amazonas and western Pará, embed a large number of public forests (> 7 Mha) that can be allocated for concessions to the private sector, represented by forestry companies and traditional communities, at a relatively fast pace. In these regions, implementing sound forest management could consolidate an essential portion of the regional timber industry, creating the conditions necessary to discourage the future expansion of the logging frontier in the Amazon.

BACKGROUND

Although a shrinkage has been observed in the industrial sector based on the use of natural forests in the Amazon in recent decades, this economic activity continues to play an important strategic role in the region. In 2016, for example, according to data compiled by the Brazilian Forest Service³, Amazon's extractive timber sector generated a total income of R\$4.4 billion, creating more than 8,000 formal jobs in the logging activities and potentially another 60,000 in industrial processing activities. These indicators suggest that the timber sector is the third most economically relevant rural activity for the region, only behind industrial scale mining and agriculture/livestock production.

However, the logging sector in the Amazon is also well recognized for the negative impacts it can generate - or even stimulate - on forests and the people involved, especially on traditional communities and rural workers. First, this activity - often carried out in

² According to AMAZON data published in Lentini et al., 2003

³ Brazilian National Forest Information System - SNIF 2019. Information compiled from sources such as IBGE (2018) and MTE/RAIS (2018). Brazilian Forest Service. Available at www.snif.florestal.gov.br



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an extensive, predatory, and poorly planned way – has historically promoted the continuous migration to new forest areas located at inland Amazônia through the continuous expansion of an unofficial road network (Veríssimo et al. 1995⁴; Souza Jr. et al., 2005⁵; Ribeiro et al., 2018⁶).

Thus, the Amazon logging sector development trajectory can be largely attributed to factors such as lack of public planning, lack of transparency, illegality, and informality. The planning of land use in the region, carried out very slowly by the federal and local governments, was an important driver for this phenomenon. Despite the introduction of more efficient command and control systems over the access to forest resources in the Amazon, the sector has developed, for the most part, around an unclear governance basis that can be defined as “assumed legality”.

This is the baseline in which actions need to be developed to ensure the transparency and information necessary to support the efforts being made by public authorities and society to promote legality in the forest sector. There is a great potential to combine the use of native forests with their conservation, benefiting entrepreneurs and the populations that depend on these forests. Even those involved in public efforts for land use planning in the Amazon recognize that there is no better alternative. We can find an example of this statement in the PPCDAm, the *Action Plan for Prevention and Control of Deforestation in the Legal Amazon*⁷, which entered its fourth phase of implementation in 2016 and recognizes that fostering sustainable use activities in the Amazon is one of the key strategies to combat the destruction of the local forests.

PURPOSES OF THIS NEWSLETTER

This publication is part of a series edited by IMAFLORA aiming to disseminate information on the timber sector in the Amazon. These publications are part of an effort being made by the organization to build a platform of transparency for the forest sector in the Amazon, to support legality and sound forest management, and to promote markets for forest products from sustainable sources.

This newsletter used a database developed by IMAFLORA based on forest guides (for transport, trading, and processing of wood and other products) made available by IBAMA (DOF system, from 2007 to September 2018) and by the state environmental agencies of Mato Grosso and Pará (Sisflora), respectively, for the years 2014 to 2018 and 2016 to 2018⁸. In this first bulletin, we will present the most relevant aggregated results related to the logging of native forests in the Amazon.

⁴ Veríssimo, A.; Barreto, P.; Tarifa, R.; Uhl, C. 1995. Extraction of a high-value natural resource from Amazon: the case of mahogany. *Forest Ecology and Management* 72: 39-60.

⁵ Souza Jr., C.; Brandão, A.; Anderson, A.; Veríssimo, A. 2005. Avanço das estradas endógenas na Amazônia. *O Estado da Amazônia*, fascículo 1. Belém: Imazon.

⁶ Ribeiro, J.; Nunes, S.; Souza Jr., C. 2018. *O Estado de Áreas Protegidas: Estradas não oficiais em Áreas Protegidas*. Belém: Imazon.

⁷ PPCDAm. *Plano de Ação para Prevenção e Controle do Desmatamento da Amazônia*. Ministry of Environment. Available at <http://www.mma.gov.br/informma/item/616-preven%C3%A7%C3%A3o-e-controle-do-desmatamento-na-amaz%C3%B4nia>

⁸ Although a significant portion of this data is widely available to any interested party, its enormous amount makes the task of extracting information from them almost impossible without prior robust information technology work. As such, we present in the publications information that is not widely accessible to general audiences interested in developing a better understanding of the behavior of the Brazilian forest industry based on this data.



EXTRACTIVE PRODUCTION FROM THE AMAZON

In 2018, the total roundwood production formally harvested from Amazonian forests for industrial purposes was about 8.8 million cubic meters¹. Approximately 91% of this production was extracted in the three main producing states, respectively Mato Grosso, Pará and Rondônia (Table 1). Although we did not have access to data on the authorized management forests in the same year, we estimate the area of logged forests during this period to be around 294 to 441 thousand hectares for the entire Amazon. This estimate should be seen only as a reference value, considering the great heterogeneity of logging intensities in the Amazon region resulting from various factors and also from the fact that part of the timber comes from legally deforested areas.

Table 1

Roundwood production harvested from natural forests in the Amazon for industrial purposes, 2017-18¹.

STATE	ROUNDWOOD PRODUCTION (m ³)		% OF REGIONAL PRODUCTION IN 2018	AREA HARVESTED IN 2018 (x 1,000 ha) ³
	2017	2018 ²		
Mato Grosso	4,475,031.2	4,718,822.4	53.4%	157.3 - 235.9
Pará	1,968,973.0	2,631,493.5	29.8%	87.7 - 131.6
Rondônia	1,616,614.4	769,928.2	8.7%	25.7 - 38.5
Amazonas	709,864.4	403,934.6	4.6%	13.4 - 20.2
Roraima	334,898.4	175,072.4	2.0%	5.8 - 8.7
Amapá	228,575.6	53,679.1	0.6%	1.8 - 2.7
Acre	144,846.0	79,417.1	0.9%	2.6 - 4.0
Maranhão	4,063.7	2,304.0	0.0%	0.08 - 0.1
Tocantins	3,630.3	1,410.7	0.0%	0.05 - 0.07
Amazon	9,486,497.0	8,836,062.1	100%	294.5 - 441.8

¹ Data source: IBAMA, SEMA-MT and SEMAS-PA. Compilation made by IMAFLORA.

² Federal data from the DOF system available up to September 2018.

³ Considering an average logging intensity of 20 to 30 m³/ha, which would be typical in most Forest Management Plans run in the Amazon.

⁴ An important caveat is that IBAMA data [DOF system] is only available for the period up to September 2018. For this reason, the production of some Amazonian states, especially Rondônia and Amazonas, may have been underestimated. Therefore, we also present in Table 1 estimates for 2017, the year for which all data from the official systems were available.

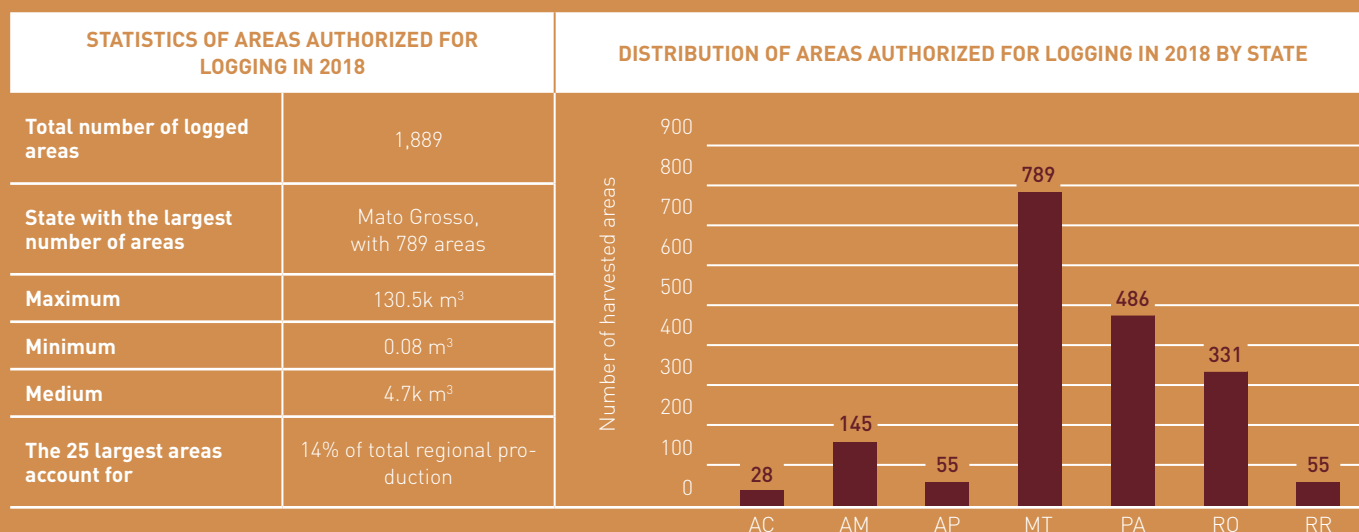


CHARACTERISTICS OF FORESTRY PRODUCTION AREAS

In 2018, 1,889 forest areas in which timber was logged for industrial purposes in the Amazon were registered in the official transport and commercialization control systems. These areas are mainly located in the state of Mato Grosso (42%). Most of these forest management operations can be considered of small proportion, with an average of only 4.7 thousand cubic meters of roundwood logged in that year (Table 2).

Table 2

Descriptive statistics of natural forest areas producing roundwood for industrial purposes in the Brazilian Amazon, 2018^{1,2}.



¹ Data source: IBAMA, SEMA-MT and SEMAS-PA. Compilation made by IMAFLORA.

² The analyses ignore the two smallest timber-producing states of the Amazon, Maranhão and Tocantins.

In fact, only 13 forest management areas in the entire region produced more than 40,000 cubic meters in that year. The largest forests together accounted for an important portion of total production in the region, with the 25 largest producing areas in that year (only 1.3% of the total) concentrating 14% of regional production. These areas match forest management plans implemented in certified areas today or in the past, or even in public areas formally granted to the private sector. However, although we did not have access to the information databases on management areas authorized for logging in 2018, we can state, based on the data characteristics, that most production areas were represented by small management plans implemented in private areas that, in many cases, could only support a few years of logging.



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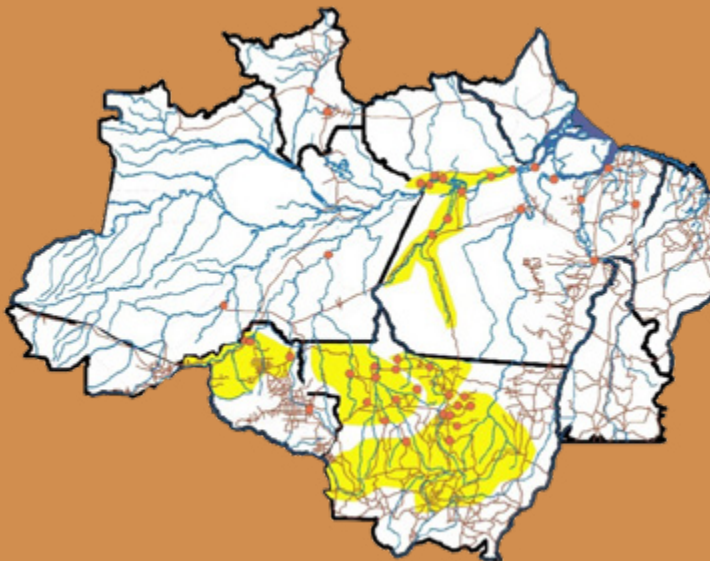


THE NEW GEOGRAPHY OF TIMBER PRODUCTION IN THE AMAZON

In 2018, most of the roundwood produced was harvested from central regions of the Amazon (Figure 1). In fact, three logging zones in Mato Grosso – added to those in northern Rondônia and western Pará – accounted for approximately ¾ of total Amazon production that year.

Figure 1

Main logging center and forestry regions producing roundwood for industrial purposes harvested from natural forests in the Amazon, 2018. The regions with the highest regional production in the same year are highlighted in yellow.



ZONE	LOG VOLUME (2018)	% TOTAL
Northwestern Mato Grosso	2.799.277,3	31,7 %
Northwestern Pará	1.465.369,1	16,6 %
Center Mato Grosso	1.404.513,0	15,9 %
North Rondônia	588.313,5	6,7 %
North Mato Grosso	515.032,1	5,8 %
Eastern Pará	467.499,6	5,3 %
Estuarine Pará region	439.372,8	5,0 %
Southern Amazonas	317.970,6	3,6 %
Roraima	175.072,4	2,0 %
Center Pará	151.294,8	1,7 %
Southern Rondônia	138.162,9	1,6 %
Pará metropolitan area	107.957,2	1,2 %
Manaus vicinities	85.640,0	1,0 %
Acre	79.417,1	0,9 %
Amapá	53.679,1	0,6 %
Center Rondônia	43.451,8	0,5 %
Western Amazonas	324,0	0,0 %

The new geography of logging activity in the Amazon is not surprising. According to different studies on the sector conducted in the past decade (such as those conducted by Schneider et al. 2000¹⁰, Lentini et al. 2003¹¹, 2005¹²; Stone, 1998¹³), this was already the expected behavior of the timber industry. There was always the expectation that the industry, active along the “arc of deforestation” until the 1980-1990s, would slowly move to the core regions of the Amazon in the following decades. This is because, as already mentioned, the forest industry in the Amazon remains essentially the same in terms of the continued need to log new forests to ensure its long-term survival. The slow progress observed in the adoption of sound forest management on a large scale is a key contributor to this fact.

¹⁰ Schneider, R., Arima, E., Veríssimo, A., Barreto, P., Souza Jr., C., 2000. *Amazônia Sustentável: limitações e oportunidades para o desenvolvimento rural*. World Bank and IMAZON, Brasília (Brazil).

¹¹ Lentini, M., Veríssimo, A.; Sobral, L. *Fatos Florestais da Amazônia 2003*. Belém: Imazon.

¹² Lentini, M., Pereira, D., Celentano, D., Pereira, R., 2005. *Fatos Florestais da Amazônia 2005*. Belém: Imazon.

¹³ Stone, S.W., 1997. *Economic trends in the timber industry of Amazonia: Survey results from Para State, 1990-1995*. *Journal of Developing Areas* 32, 97-121.



EVOLUTION OF THE TIMBER SECTOR IN THE AMAZON IN THE LAST 20 YEARS

The production of wood from natural forests has been decreasing systematically over the last 30 years. According to data from IBGE, for example, in 1990, production from native forests was about 47 million cubic meters, while that from planted forests totaled approximately 100 million cubic meters. By the end of the 1990s, while production from planted forests had not changed much, that from native wood had fallen to around 28 million cubic meters, according to IMAZON information. In 2018, according to data from official forest control systems in the Amazon presented above, this production was 8.8 million cubic meters (Table 3).

Table 3

Evolution of the Amazon logging sector based on natural forests, 1998- 2018.¹

DESCRIPTION	1998	2018
ROUNDWOOD PRODUCTION (m ³)	28,260,000	8,836,062
MAIN TIMBER PRODUCING STATE (% OF TOTAL)	Pará (40%)	Mato Grosso (53%)
MAIN TIMBER PROCESSING CENTERS ²	Paragominas, Sinop, Tailândia, Ariquemes, Jacundá	Colniza, Aripuanã, Sinop, Porto Velho, Benevides
NUMBER OF PROCESSING CENTERS ²	72	49
ESTIMATED REVENUE (R\$ MILLION)	2,900	4.424 ³ (referring to 2016)

¹ Data source referring to 1998: Lentini et al. 2003 (IMAZON). Data source referring to 2018: IBAMA, SEMA-MT and SEMAS-PA. Compilation made by IMAFLORA.

² In 1998, IMAZON considered as "pole" all aggregations of geographically nearby municipalities capable of producing at least 100,000 cubic meters of roundwood per year. For 2018, the data refers to all localities that produced at least 50 thousand cubic meters.

³ Source: IBGE, from data compiled by the Brazilian Forest Service.

When comparing the data for 1998 and 2018, we noted major differences in the general profile of the Amazonian timber industry. First, regarding the drop in production, which has surpassed the 2/3 level in 20 years. Secondly, as already discussed above, as a result of the migration of the main production centers from regions closer to the "arc of deforestation", as observed in Paragominas, to core Amazon regions, represented by municipalities such as Colniza and Aripuanã. This change in the relative importance of the different regions was an implication, to a large extent, from the fact that the state of Pará ceased to be the main producing state in the Amazon and was overtaken by Mato Grosso (Table 3).



FINAL CONSIDERATIONS FOR THE STAKEHOLDERS INVOLVED AND PUBLIC POLICY-MAKERS

The economic geography of the timber industry has changed in the last 20 years. Unfortunately, the worst-case scenario predicted in different studies in the past has become a reality as the forest sector continues to deplete forests along the “arc of fire and deforestation” and migrate to forestlands located at the core regions of the Amazon. This occurred because logging activity essentially maintained the same pattern of behavior seen in the past, while due to the poor adoption of forest management practices, it continued to be extensive, predatory, and unplanned.

As a matter of fact, the Amazonian lumber industry continues to represent a great paradox as it encourages the destruction of resources necessary for its economic long term survival. At its root, this problem can also be attributed to the slow governmental advances in the sense of adequately ordering the logging activity and, effectively, the Amazonian territory itself. If public forest concessions had been regulated two decades earlier, the regional timber industry could be very different today.

However, not coincidentally, the migration of the timber industry has generated more deforestation and forest degradation in the newly colonized regions. The intensification of deforestation in northwest Mato Grosso, southern Amazonas, and western Pará over the past decade, as remotely identified by PRODES¹⁴, continues to be an indicator of this relationship. The increase noticed in deforestation rates in formally protected areas located in the same region, as identified in recent years in studies by entities such as IMAZON¹⁵, is also closely related to this phenomenon.

Forest management is still the best alternative for maintaining the productive value of forests intended for timber and non-timber production. If responsible forest management had been adopted on a large scale in previous decades, likely this migration of the timber industry to central regions of the Amazon would not be occurring. However, the pace in the adoption of forest management has been slow since different techniques began to be adapted to the regional conditions in Brazil, a phenomenon most intensely observed between 1993 and 1998 in eastern Pará. Currently, based on indicators such as forest areas certified by the FSC (Forest Stewardship Council) and public areas under concessions, we estimate that less than 2.5 million hectares are being adequately managed in the Amazon. In fact, in light of official data from official control systems, we estimate that forest concessions accounted for about 3% of regional production in 2018.

¹⁴ PRODES. Project for Monitoring the Amazon Forest by Satellite. Available at <http://www.obt.inpe.br/OBT/assuntos/programas/amazonia/prodes>. A detailed breakdown of deforestation monitoring data at the municipal level is available on the DPI/Prodes platform at <http://www.dpi.inpe.br/prodesdigital/prodes.php>.

¹⁵ An example of a study that proves our claims regarding the relevant geographical areas can be found in Araújo, E., Barreto, P., Baima, S., Gomes, M. 2017. Most deforested Conservation Areas in the Legal Amazon (2012-2015) (p. 92). Belém: Imazon.



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However, there is still time for corrective actions. **Some of the regions inserted in the new logging frontier embed a large number of public forests** that can be allocated at a relatively fast pace for forestry projects – both for forestry companies under concession contracts and for royalty-free enterprises such as dwelling traditional communities, as is the case of Extractive Reserves, for example. We estimate that about seven million hectares of public forests¹⁶ could be used for this purpose in southern Amazonas and western Pará. In these regions, the clear implementation of forest management, monitored, verified, and supported by continuous cycles of technical improvement, could consolidate a significant portion of the regional timber industry permanently. In this way, we believe that it is possible to take appropriate measures so that the current logging frontier in the Amazon becomes sustainable and definitive.

Based on the same rationale developed above, **the relative importance of the Mato Grosso and Rondonia forest sectors in the current profile of the Amazonian timber industry raises concern from the standpoint of its long-term stability.** The land tenure structure of both states is characterized by the scarcity of public areas for forest production¹⁷ and even of large private areas capable of supporting consistent timber production over a cutting cycle¹⁸. In other words, forest production in these regions comes largely from relatively small private areas that are only able to support one or a few years of logging or from agrarian reform settlements. We expect that these forestlands, once logged, might lose much of their value in the view of their owners, generating a great incentive for their conversion. Despite the existence of regions that still hold many private forests for forest production (such as Nova Maringá in Mato Grosso, for example), it is expected that these regions will not remain productive in the long term without additional economic incentives being offered to their owners to remunerate the ecosystem services provided by these areas (REDD+, water, among others).

Our experience with the databases of the forestry official command and control systems **suggests that the formation of big data and the maintenance of a comprehensive and open policy of transparency in the long term must be the pillars of any conservation strategy for the Amazon.** In this and the next issues of the series of publications that will be released based on the analysis of the official control databases, we will demonstrate that this tool can offer information of great relevance for public policies, enforcement actions, and public planning directed to the allocation of forestlands. This intelligence strategy will also allow the scarce resources allocated to command and control activities to be used more efficiently.

¹⁶ Adding up the area of all the National and State Forests and the Extractive Reserves existing in these regions, we have about 12.2 million hectares of public forests that could be used for forest management. Even if we consider that only 60% of the National and State Forests (~9.8 million hectares) and 50% of the RESEX (~2.4 million hectares) were used for this purpose, we would have an area available for forest management of about 7.1 million hectares.

¹⁷ Except for a few National Forests (Flonas), such as the Jamari Flona, the first unit to be granted a forest concession, in 2007.

¹⁸ Typically, 25 to 35 years for forest management implemented on a industrial scale.



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About Imaflora:

Imaflora (Institute of Forestry and Agricultural Management and Certification) is a Brazilian, non-profit organization created in 1995 to promote conservation and sustainable use of natural resources and to generate social benefits in the forest and agricultural sectors.

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