BRAZILIAN FOREST SERVICE

BRAZILIAN FORESTS
at a glance

2019

Ministry of Agriculture, Livestock and Food Supply

Ministry of Agriculture, Livestock and Food Supply

Brazilian Forest Service

BRAZILIAN FORESTS 2019
at a glance

Mission of the Ministry of Agriculture, Livestock and Food Supply:
To promote sustainable development of Brazilian agriculture and the safety and competitiveness of its products

Brasília - DF
MAPA
2019

1st Edition. Year 2019
1,600 copies

Distribution and information:
Ministério da Agricultura, Pecuária e Abastecimento
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Catalogação na Fonte
Biblioteca Nacional de Agricultura – BINAGRI

Brazil. Ministry of Agriculture, Livestock and Food Supply.
Brazilian forests at a glance : 2019 / Ministry of Agriculture, Livestock and Food Supply. Brazilian Forest Service – Brasília : MAPA/SFB, 2019
207 p., il.; 9 x 12,5 cm.

ISBN 978-85-7991-129-3

1. Brazilian Forests. 2. Forests Management. 3. Forest Sector. 4. Forest Education and Research. 5. Biodiversity and Forests. II. Título.

AGRIS K01

Kelly Lemos da Silva CRB1-1880

Atlantic Forest in São Pedro da Aldeia - State of Rio de Janeiro

Foreword

Ipê Roxo - State of Tocantins

The Brazilian Forest Service's (SFB) mission is to promote knowledge, sustainable use and expansion of forest cover, aiming to make the forest agenda strategic for the economy and the development of our country. Since its foundation, in 2006, SFB has strived to collect and update data and information, available from several national sources and produced by the main actors involved in management, use, conservation and restoration of our forests, in a concise way, in order to simplify data consultation.

Considering the challenges faced by our forested areas, offering reliable, relevant and updated data that can help the decision-making process and foster better forest resource managing is crucial. With this in mind, we launch this new edition of Brazilian Forests at a glance – 2019, that encompasses data from 2013 to 2018.

This publication serves anyone interested in the matter, and the information within it reveals the dimension and importance of natural and planted forests. For this, we offer society the forest information system, so they can face the challenges and embrace the opportunities for protection and sustainable production of forest goods and services.

Valdir Colatto
Director General of the Brazilian Forest Service

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BRAZILIAN TERRITORY

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APPENDICE AND ANNEX

Summary

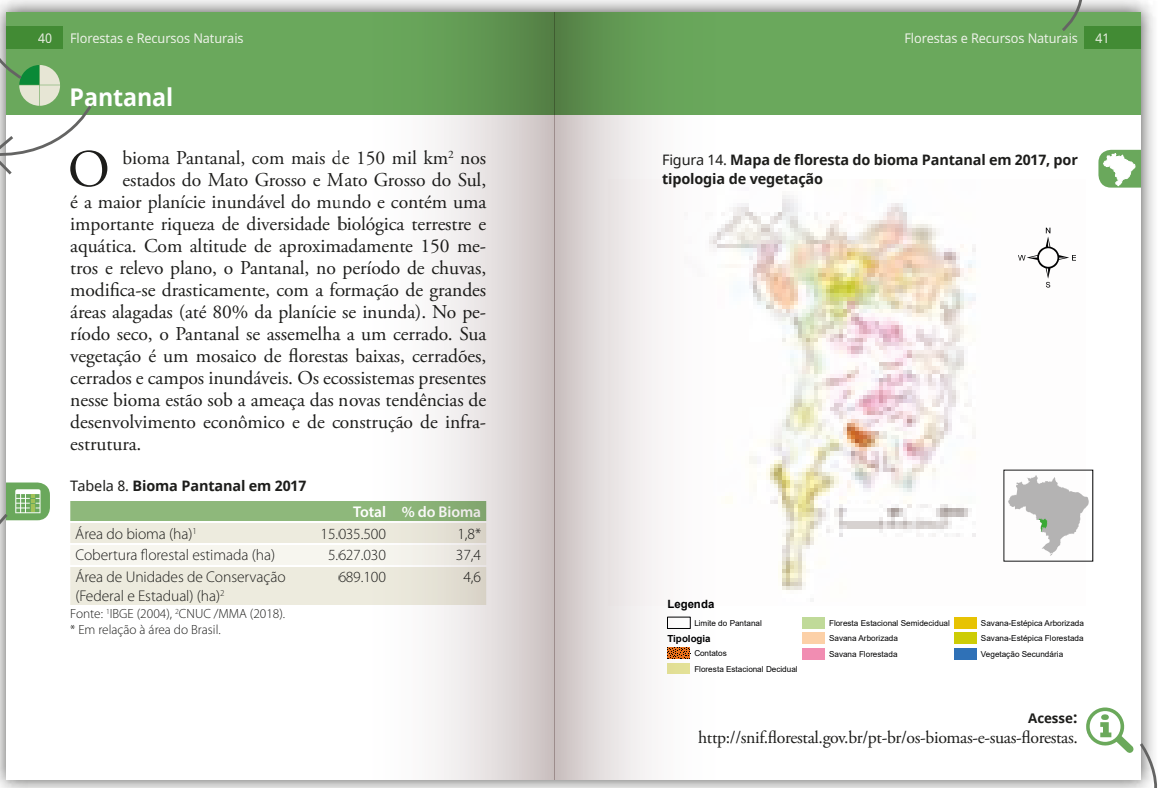
How to Navigate through the publication

The contents of this book originate from the National Forest Information System - NFIS. Some book icons serve to assist chapter navigation and quick identification of forest information display elements.

NFIS thematic axis

Title

Subtitle



40 Florestas e Recursos Naturais

Pantanal

O bioma Pantanal, com mais de 150 mil km² nos estados do Mato Grosso e Mato Grosso do Sul, é a maior planície inundável do mundo e contém uma importante riqueza de diversidade biológica terrestre e aquática. Com altitude de aproximadamente 150 metros e relevo plano, o Pantanal, no período de chuvas, modifica-se drasticamente, com a formação de grandes áreas alagadas (até 80% da planície se inunda). No período seco, o Pantanal se assemelha a um cerrado. Sua vegetação é um mosaico de florestas baixas, cerradões, cerrados e campos inundáveis. Os ecossistemas presentes nesse bioma estão sob a ameaça das novas tendências de desenvolvimento econômico e de construção de infraestrutura.

Tabela 8. **Bioma Pantanal em 2017**

	Total	% do Bioma
Área do bioma (ha)[1]	15.035.500	1,8*
Cobertura florestal estimada (ha)	5.627.030	37,4
Área de Unidades de Conservação (Federal e Estadual) (ha)[2]	689.100	4,6

Fonte: [1]IBGE (2004), [2]CNUC /MMA (2018).
* Em relação à área do Brasil.

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Figura 14. **Mapa de floresta do bioma Pantanal em 2017, por tipologia de vegetação**

Acesse:
http://snif.florestal.gov.br/pt-br/os-biomas-e-suas-florestas.

Access icon for forest information

Access icon for NFIS link

NFIS Thematic Axis

Forests and Forest Resources

Forest Policies and Management

Forest Production, Economy and Market

Forest Education and Research

Throughout the publication the texts are accompanied by icons that graphically represent the content available, making it more accessible and easily identified:

Tables: numerical representation of the various information in this publication.

Graphics: graphical representation of the information.

Maps: cartographic representation of the Brazilian territory information.

Infographics: graphical visual representation of data.

Links: provide the access addresses to the detailed information of the themes presented in this publication.

At the end of each section, the links of the National Forestry Information System (NFIS) and the Brazilian Forest Service (SFB) website are available, providing detailed information on each subject.

Jacunda National Forest - State of Rondônia

Brazilian Territory

Federative Units

Figure 1 - **Federative Units**

Source: IBGE (2017).

Climate

Figure 2 - **Climate**

Source: IBGE (2016),

Soils

Figure 3 - **Soils**

Source: IBGE (2006).

Hydrographic Regions

Figure 4 - **Hydrografic Regions**

Source: ANA (2013).

Vegetation

Figure 5 - **Vegetation**

Jamari National Forest - State of Rondônia

FORESTS AND FOREST RESOURCES

Aerial view - National Forest Inventory
State of Roraima

What is a Forest?

The Brazilian Forest Service, when developing its actions and elaborating national and international reports on forest resources in Brazil, considers as forests the lands that correspond to the following vegetation typologies according to the Classification System of the Brazilian Institute of Geography and Statistics (IBGE):

- ✓ Dense Humid Forest;
- ✓ Open Humid Forest;
- ✓ Mixed Humid Forest;
- ✓ Semideciduous Seasonal Forest;
- ✓ Decidual Seasonal Forest;
- ✓ *Campinarana* (forested and wooded);
- ✓ Savannah (forested and wooded) - *Cerradão* and *Campo-Cerrado*;
- ✓ Steppe Savannah (forested and wooded) - Wooded *Caatinga*;
- ✓ Steppe (tree steppe);
- ✓ Vegetation influenced by sea and/or inland waters - sandbank coastal vegetation, mangroves, and palm groves;
  Transitional zones with at least one forest formation;
- ✓ Secondary Vegetation in Forest areas;
- ✓ Reforestation.

Definition of forest adopted by FAO

"Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 %, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use."

FAO (2018)

Jamari National Forest - RO

Extent of Forests

Brazil is a forest country with nearly 500 million hectares (59% of its territory) of natural and planted forests - representing the second largest forest area in the world, only surpassed by Russia.

Table 1 - **Estimated forest areas in Brazil in 2018**

Type of Forest	Total area (ha)	Forest area %	Brazil area %
Natural Forests	488,066,946	97.60	57.31
Planted Forests*	9,839,686	1.97	1.16
Total	**497,906,632**	**100**	**58.47**

*Source: PEVS/IBGE 2018

Amazon Forest - AM

Figure 6 - **Brazilian forests estimated in 2018**

Natural Forests in the Biomes

The total natural forest area was estimated by the Brazilian Forest Service based on IBGE's vegetation map from 2018, using a 250,000 map scale. Being a vegetation map, with no intention to register land use and occupation, it was used as a base for the identification of the original vegetation, attributing to each polygon the dominant typology from a composite category.

Table 2 - **Estimated area of natural forests in the Brazilian biomes in 2018**

Biome	Area (ha)
Amazon	334,611,999
Caatinga	36,268,803
Cerrado	90,207,755
Atlantic Forest	19,260,873
Pampa	2,271,969
Pantanal	5,445,547
Total	**488,066,946**

This information was combined with deforestation/ anthropism data released by other surveys: Satellite Monitoring Project of Brazilian Biomes Deforestation – PMDBBS/Ibama-MMA, PRODES/INPE Project (Amazon and Cerrado Biomes); updating the remaining original areas up to the most recent year for each biome

(Amazon: 2018; Cerrado: 2018; Caatinga: 2011; Atlantic Forest: 2009; Pampa and Pantanal: 2016). Besides that, for the Amazon, Cerrado and Pantanal Biomes, the secondary vegetation - in previously deforested areas - was added, according to TerraClass/ INPE-Embrapa Project. The outcome intersecting area resulted in an estimated forest vegetation area for 2018.

National Forest Inventory in Monte do Carmo - State of Tocantins

Amazon

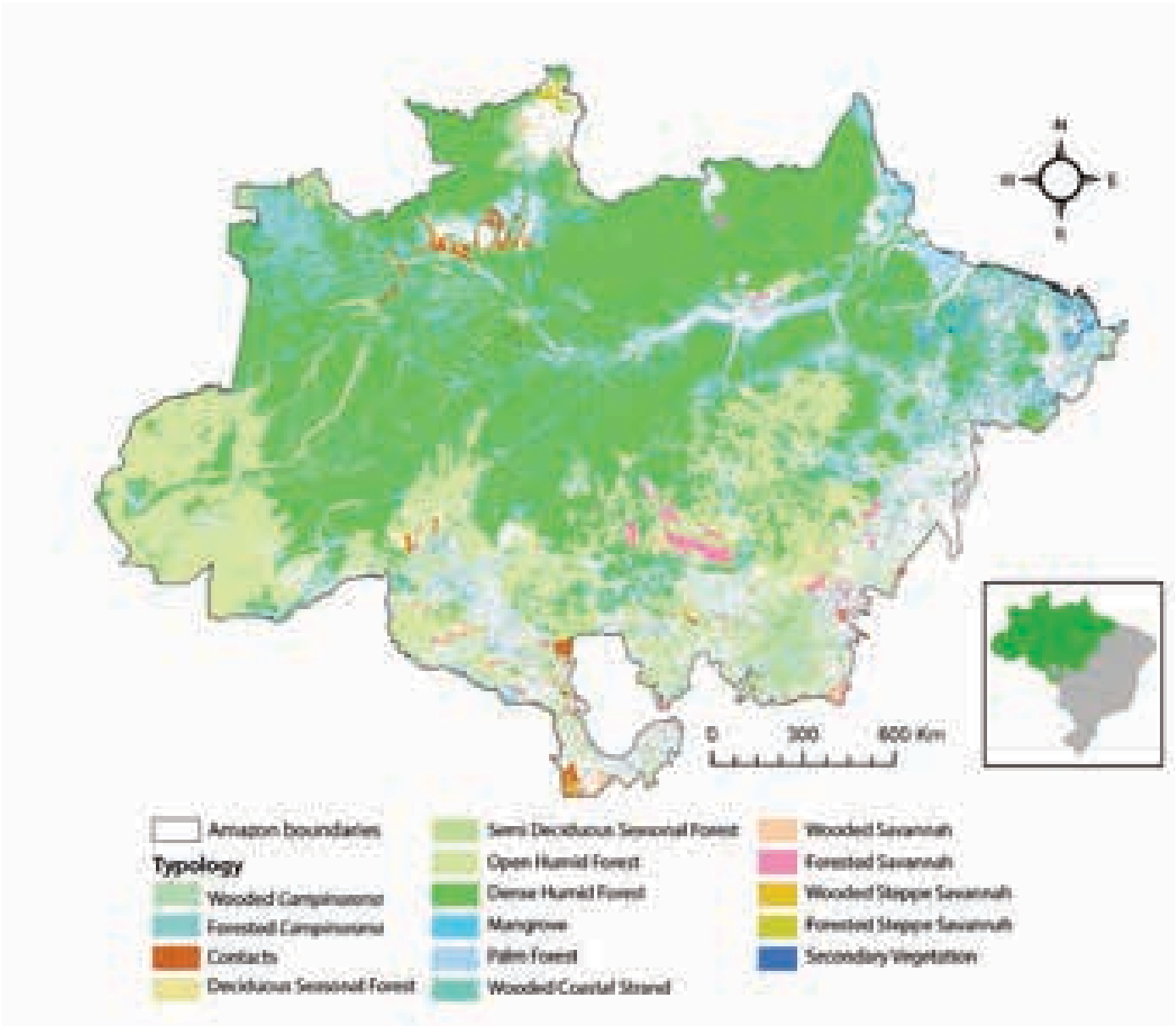
The Amazon biome covers a 4.2 million km² area, corresponding to 49.3% of Brazil's territory and 5% of the planet's surface. It is considered the biggest biological diversity reserve in the world, and some estimate that it holds at least half of all the living species. This biological diversity is a result of the interaction of several geo-climatic conditions. Dense humid forest is the main vegetation typology, characterized by tall trees, including the variations "*igapó* forest" and "*várzea* forest". Another well represented typologies are the open humid forest, semideciduous and deciduous seasonal forest, as well as savannah and Campinarana (IBGE, 2004). The Amazonic hidrographic basin holds 81% of the superficial water availability of the country (ANA, 2018). This biome contains vast stocks of carbon and commercial timber, and has a wide variety of non-timber forest products, which support various local communities.

Table 3 - **Amazon Biome in 2018**

	Total	Biome %
Biome area (ha)[1]	419,694,300	49.3*
Estimated forest cover (ha)	334,611,999	79.7
Area of Conservation Units (Federal and State) (ha)[2]	120,275,000	28.5

Source: [1]IBGE (2004), [2]CNUC/MMA (2018).
* In relation to Brazil area.

Figure 7 - **Forests of the Amazon Biome in 2018, per vegetation typology**



Caatinga

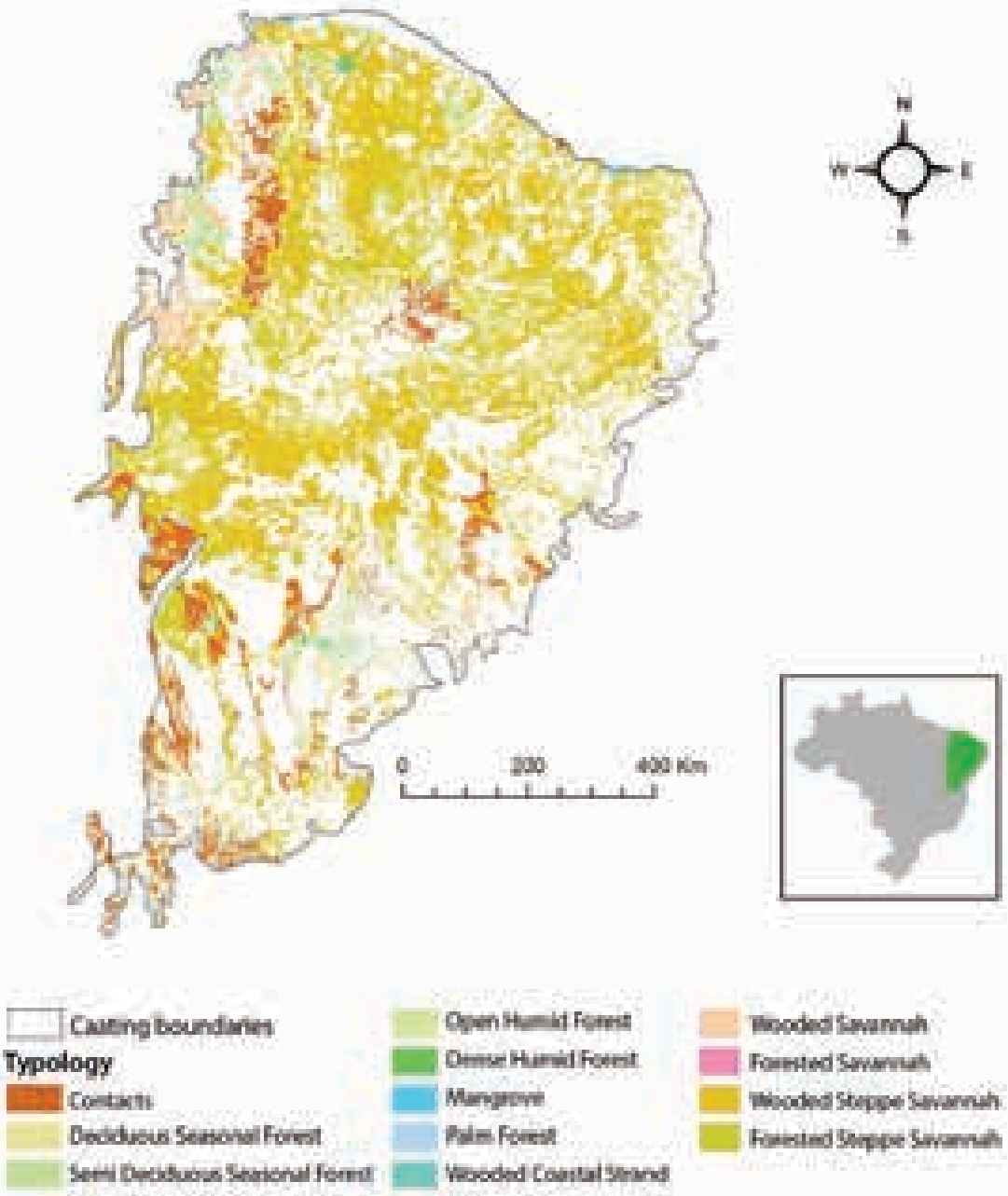
The Caatinga is is an exclusively Brazilian biome. Located in the northeast region, it occupies an area of approximately 845,000 km², which represents around 10% of Brazil's territory, and it covers large extensions of the northeast region and northern Minas Gerais state. Its vegetation is mostly forested stepped savannah, with small trees and shrubs that usually lose their leaves during the dry season. (*deciduous* species) and many cacti species. Despite being a semiarid region, with low pluviometric indexes (300 to 800 mm/year), Caatinga is very heterogeneous, containing at least a hundred types of unique landscapes, of which the lagoons or temporary humid areas, the mountainous refuges and the permanent rivers, like the São Francisco. The Caatinga biome suffers gravely from degradation, especially desertification processes.

Table 4 - **Caatinga Biome in 2018**

	Total	Biome %
Biome area (ha)[1]	84,445,300	9.9*
Estimated forest cover (ha)	36,268,803	42.9
Area of Conservation Units (Federal and State) (ha)[2]	7,452,900	7.7

Source: [1]IBGE (2004), [2]CNUC/MMA (2018).
* In relation to Brazil area.

Figure 8 - **Forests of the Caatinga Biome in 2011, per vegetation typology**



Cerrado

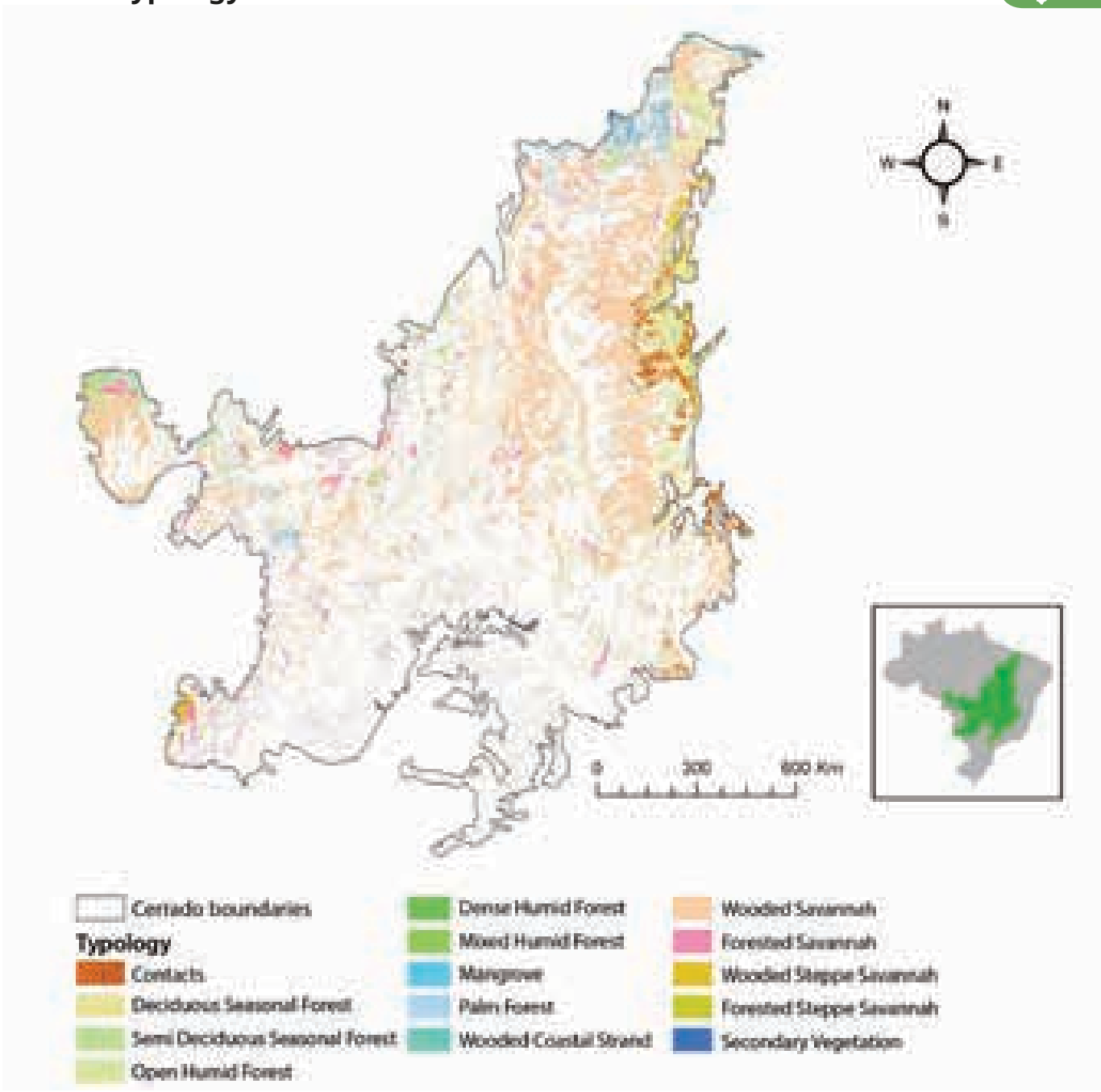
The Cerrado is the second largest biome in the country. It covers mainly the central region of Brazil, and has around 2 million km² (24% of the territory). Cerrado is one of the savannahs with the largest biodiversity in the planet, and with high concentration of endemic species. The Cerrado vegetation has a gradient of phytophysiognomies that vary from grasslands to forests, with intermediate variations on the proportions of trees and herbaceous components. *Cerrado* contains a large biodiversity and plays an essential role in regulating the hydrologic cycle. In fact, the origin of the main hydrografic basins in the country (Araguaia, Tocantins, Xingu, Tapajós, Paraguai and São Francisco) are located there.

Table 5 - **Cerrado Biome in 2018**

	Total	Biome %
Biome area (ha)[1]	203,644,800	23.9*
Estimated forest cover (ha)	90,207,755	44.3
Area of Conservation Units (Federal and State) (ha)[2]	17,773,700	28.5

Source: [1]IBGE (2004), [2]CNUC/MMA (2018).
* In relation to Brazil area.

Figure 9 - **Forests of the Cerrado Biome in 2018, per vegetation typology**



Atlantic Forest

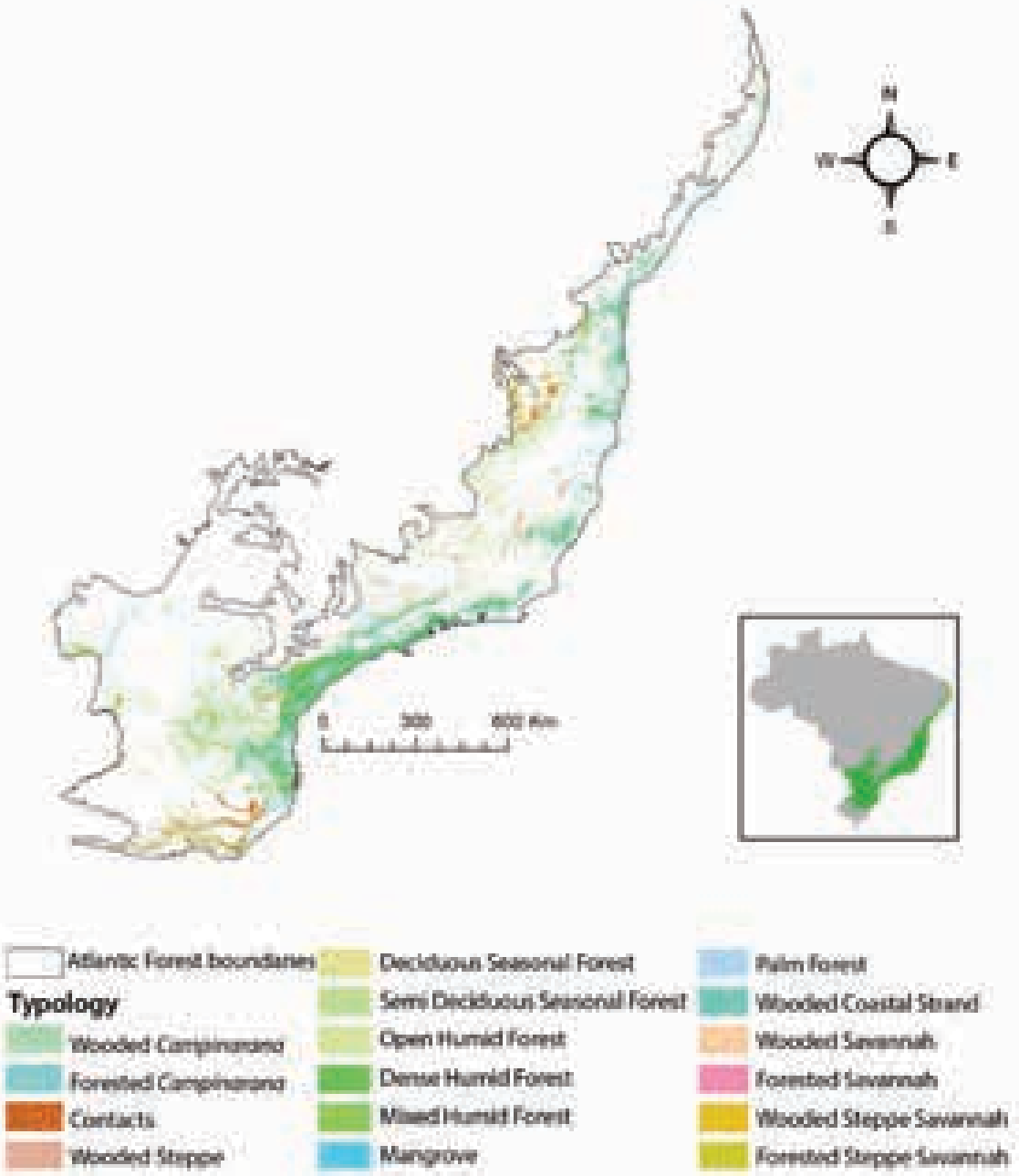
The Atlantic Forest biome and its associated ecosystems occupy a 1,1 million km² area (13% of Brazil's territory). Currently, due to centuries of environmental destruction, the forested area of the Atlantic Forest is highly fragmented and reduced to just 193,000 km². Nevertheless, the Atlantic Forest still hosts a significant portion of Brazil's biological diversity. This biome is composed by many forest typologies, such as humid forest (dense, mixed and open), semideciduous and deciduous seasonal forests, mangroves, sandbank coastal vegetation, altitude fields and inland swamps in northeast Brazil. The forests with araucaria trees (mixed humid forest) are found in plateaus in the south region, west of the Serra do Mar mountains. There is a great number of endangered species in this biome.

Table 6 - **Atlantic Forest Biome in 2018**

	Total	Biome %
Biome area (ha)[1]	111,018,200	13.0*
Estimated forest cover (ha)	19,260,873	17.3
Area of Conservation Units (Federal and State) (ha)[2]	11,553,700	10.4

Source: [1]IBGE (2004), [2]CNUC/MMA (2018).
* In relation to Brazil area.

Figure 10 - **Forests of the Atlantic Forest Biome in 2009, per vegetation typology**



Pampa

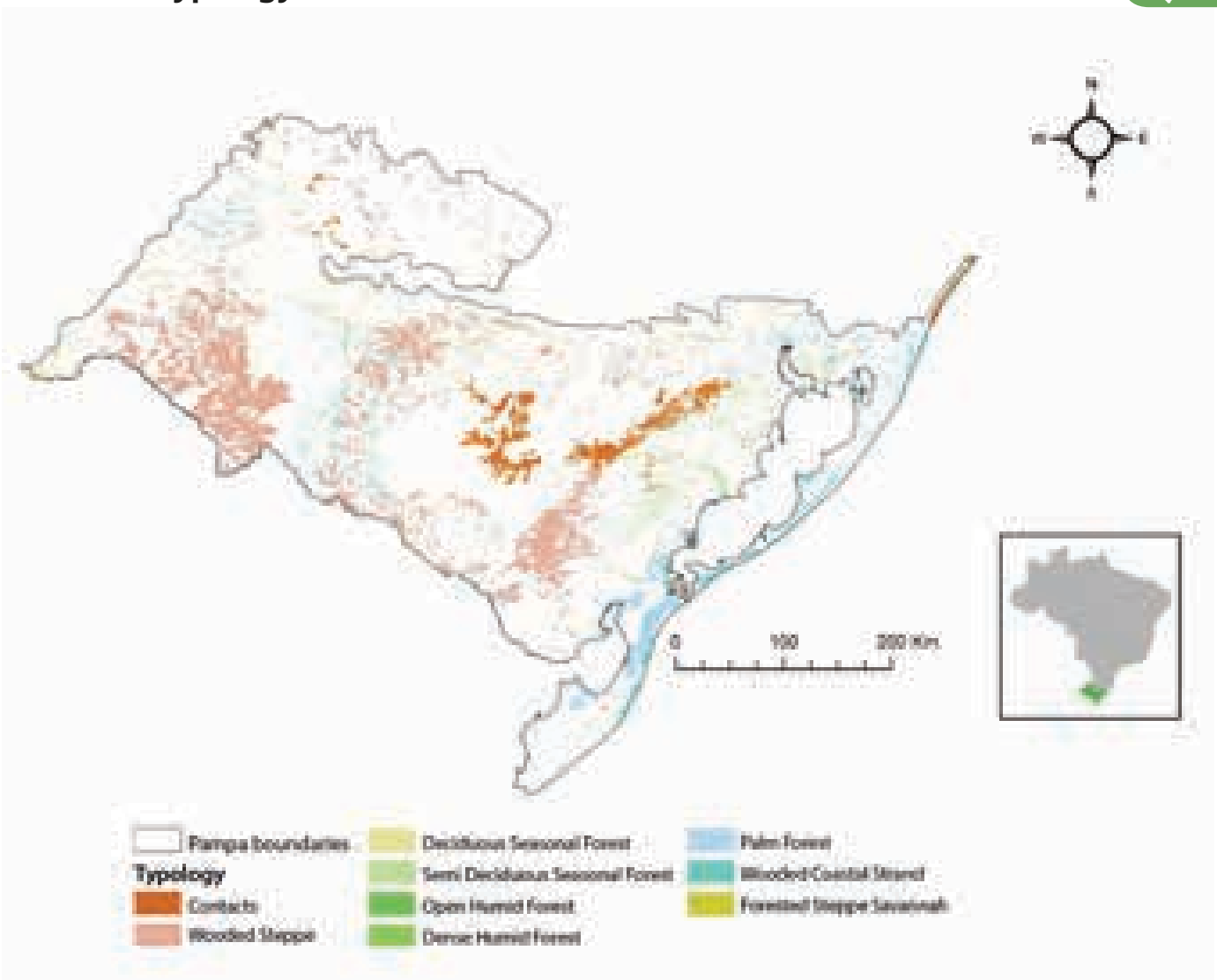
The Pampa, also known as Southern grasslands, is located in Rio Grande do Sul state, and spreads accross Uruguay and Argentina. The dominant vegetation consists of pampa grass interspersed with mesophile forests, subtropical forests (mainly Araucaria forests) and seasonal forests. It is characterized by a rich variety of herbal species and grassland typologies, which create in some regions mixed environments with Araucaria forests.

Table 7 - **Pampa Biome in 2018**

	Total	Bioma %
Biome area (ha)[1]	17,649,600	2.1*
Estimated forest cover (ha)	2,271,969	12.9
Area of Conservation Units (Federal and State) (ha)[2]	506,700	2.9

Source: [1]IBGE (2004), [2]CNUC/MMA (2018).
* In relation to Brazil area.

Figure 11 - **Forests of the Pampa Biome in 2016, per vegetation typology**



Pantanal

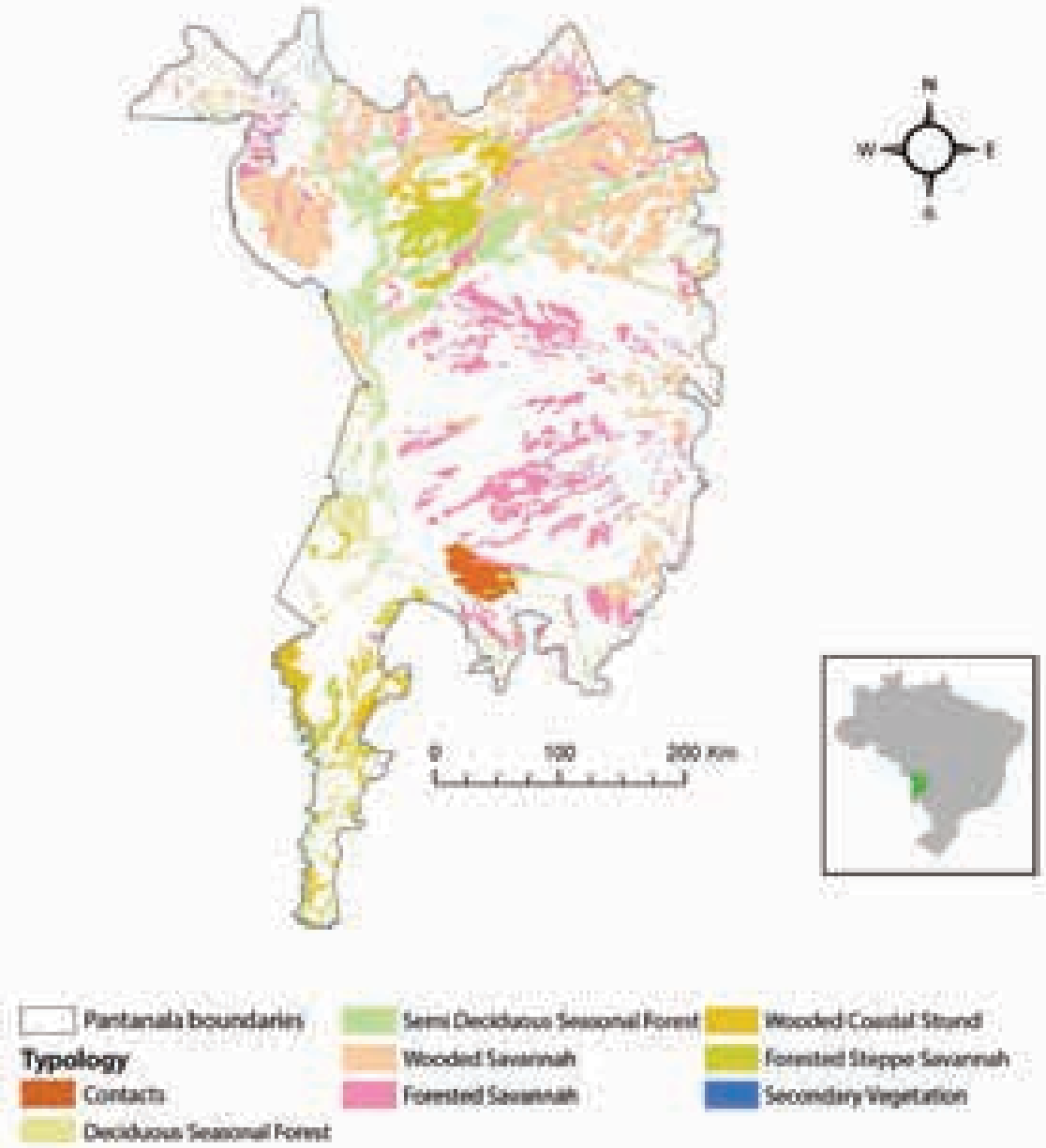
The Pantanal biome is the largest continuous wetland in the world, containing a very rich terrestrial and aquatic biodiversity. It covers over 150,000 km² of Mato Grosso and Mato Grosso do Sul states. With an altitude of approximately 150m and flat terrain, the Pantanal changes drastically during the rainy season, forming large flooded areas (up to 80% of the Floodplains). In the dry season, Pantanal resembles the Cerrado. Its vegetation is a mosaic of shrublands, grasslands and wetlands.

Table 8 - **Pantanal Biome in 2018**

	Total	Bioma %
Biome area (ha)[1]	15,035,500	1.8*
Estimated forest cover (ha)	5,445,547	36.2
Area of Conservation Units (Federal and State) (ha)[2]	689,100	4.6

Source: [1]IBGE (2004), [2]CNUC/MMA (2018).
* In relation to Brazil area.

Figura 12 - **Forests of the Pantanal Biome in 2016, per vegetation typology**



Visit:
http://snif.florestal.gov.br/pt-br/os-biomas-e-suas-florestas

Forest Plantations

The Decree nº 8,375, from December 11 of 2014, states the Agricultural Policy for Planted Forests, referring to production, processing and trading activities of the products, by-products, services and inputs related to forest plantations. The survey of planted forests is divided by type and is carried on by The Brazilian Institute of Geography and Statistics (IBGE) as part of the survey "Vegetal Extraction and Forestry Production" (PEVS). The Brazilian Tree Industry (Ibá), an association responsible for the institutional representation of the production chain of planted trees, also presents information about tree-planted areas from its affiliated members.

According to IBGE, Brazil has around 10 million hectares of forest plantations, mainly with species of *Eucalyptus* and *Pinus* genera, which represent 96% of the total area. Forest plantations amount to 1.2% of Brazil's area, and 2.0% of the total forest areas.

Table 9 - **Composition of forest plantations in Brazil**

Plantation	Area (ha)	%
Eucalipto	7,401,334	75.2
Pinus	2,030,419	20.6
Other	407,933	4.2
Total	**9,839,686**	**100**

Source: PEVS/IBGE (2018).

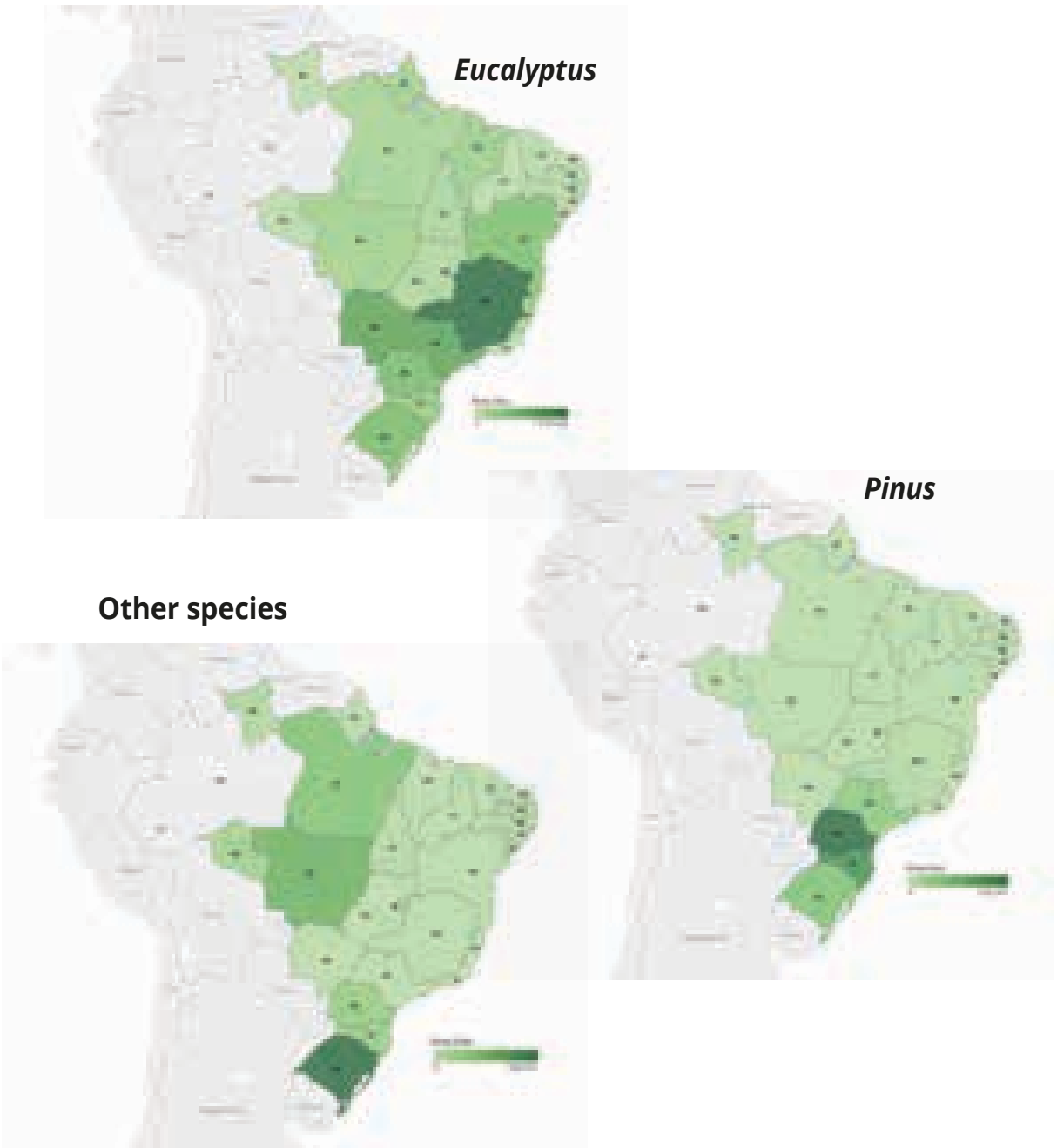
Eucalyptus plantation - State of Tocantins

Table 10 - **Distribuition of forest plantations per state**

State	Area with *Eucalyptus* (ha)	Area with *Pinus* (ha)	Other species (ha)	Total area (ha)
MG	1,912,194	36,405	4,996	1,953,595
PR	670,954	896,242	22,571	1,589,767
MS	1,117,740	5,252	-	1,122,992
SP	883,828	194,639	3,801	1,082,268
RS	593,597	272,779	146,166	1,012,542
SC	353,824	610,944	30,138	994,906
BA	567,003	575	-	567,578
ES	269,526	2,491	375	272,392
MT	189,296	-	74,115	263,411
MA	235,655	-	9,511	245,166
PA	151,894	-	51,025	202,919
GO	156,650	7,625	2,078	166,353
TO	145,141	428	6,211	151,780
AP	49,489	48	1,478	51,015
PI	37,369	-	-	37,369
RJ	36,404	8	891	37,303
RR	-	-	28,920	28,920
RO	7,000	2,000	17,435	26,435
AL	15,436	-	1,524	16,960
PB	1,013	-	5,044	6,057
DF	3,492	983	237	4,712
SE	3,550	-	30	3,580
PE	271	-	1,063	1,334
CE	8	-	263	271
RN	-	-	61	61
AC	-	-	-	-
AM	-	-	-	-
Total	**7,401,334**	**2,030,419**	**407,933**	**9,839,686**

Source: PEVS/IBGE (2018).

Figure 13 - **Distribuition of forest plantations in Brazil, in 2017, per plantation**



Source: PEVS/IBGE (2018).

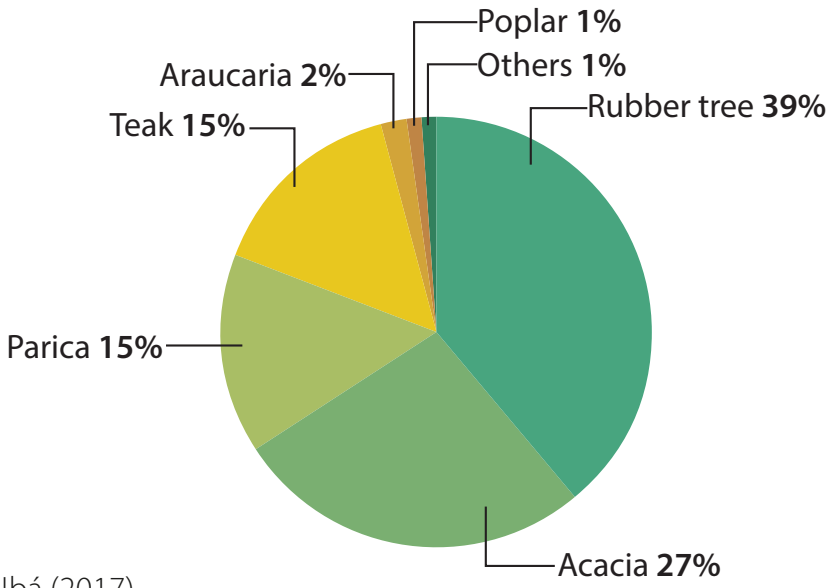
The Brazilian Tree Industry (Ibá), releases annually a report with the main indicators of the national planted forest sector, based on its affiliated members. It adds information, not present in the IBGE database, which is the planted area by species other than *Eucalyptus* spp. and *Pinus* spp.

Table 11 - **Composition of forest plantation areas in Brazil, with other species**

Plantation	Species	Area (ha)	
		2010	2011
Eucalyptus	***Eucalyptus spp***	4,900,950	5,049,712
Pinus	***Pinus spp***	1,756,359	1,562,783
Acacia	***Acacia mearnsii/ Acacia mangium***	127,600	148,813
Araucaria	***Araucaria angustifolia***	11,900	11,179
Parica	***Schizolobium amazonicum***	85,470	85,473
Rubber tree	***Hevea brasiliensis***	159,500	165,648
Teak	***Tectona grandis***	65,440	67,693
Poplar	***Populus spp***	4,221	4,220
Others		8,969	8,256
Total		**7,120,409**	**7,103,777**

Source: Ibá (2017).

Graphic 1 - **Composition of forest plantation areas in Brazil, with other species**



Source: Ibá (2017).

Area (ha)				
2012	2013	2014	2015	2016
5,304,163	5,473,176	5,558,653	5,630,607	5,673,784
1,562,783	1,570,146	1,558,997	1,581,239	1,584,333
148,311	146,903	160,872	160,827	159,877
11,343	11,360	11,122	11,038	11,114
879,001	87,519	89,081	90,047	90,047
168,848	172,448	229,059	229,059	229,964
67,329	88,270	87,499	87,410	87,502
4,216	4,216	4,216	4,216	4,216
33,183	46,937	6,672	6,604	6,641
8,179,177	**7,600,975**	**7,706,171**	**7,801,047**	**7,847,478**

Visit:
http://snif.florestal.gov.br/pt-br/florestas-plantadas

Public Forests

The National Register of Public Forests (CNFP), comprises all federal states, and municipal public forested lands. It includes areas designated to Indigenous Peoples, conservation units, and other public forests located in urban or rural areas.

Araucarias - Campos do Jordão/State of São Paulo

Table 12 - **Distribuition per biome of federal and state public forests included in the National Register of Public Forests - CNFP, in 2018**

Biome	Area (million ha)	Public forests total area %
Amazon	284,98	92.2%
Caatinga	1,62	0.5%
Cerrado	17,35	5.6%
Atlantic Forest	4,03	1.3%
Pampa	0,15	0.0%
Pantanal	1,06	0.3%
Total	**309,2**	**100.0%**

Source: CNFP/SFB (2019).

Visit:
http://snif.florestal.gov.br/pt-br/cadastro-nacional-de-florestas-publicas

Forest Stocks
Volume, Biomass and Carbon

The Forest Stock is the quantification of the variables: timber volume, biomass weight and carbon weight found in forested areas. Timber volume is obtained based on the trees' height and diameter. It is an important variable used to estimate the biomass, and the commercial stock of the forests, and it is also used for forest management.

Forest biomass is an essential parameter used to understand the primary production of an ecosystem and evaluate the potential of a forest for energy production. Considering that approximately 50% of dry wood is carbon (C), forest biomass is also an important element for understanding the processes related to global climate change. Carbon stock is also used to estimate the amount of CO_2 released into the atmosphere during biomass combustion process.

With the implementation of the National Forest Inventory (NFI), forest biomass calculations can be more consistent and reliable, and are made based on primary data and proper allometric equations.

Table 13 - **Estimates of timber volume, biomass and carbon, per biomes, in natural forests, in 2018**

Biome	Total timber volume		Total biomass		Total carbon	
	Million m^3	%	Million t	%	Million t	%
Amazon	109,404	92.8	96,046	92.8	47,354	92.8
Caatinga	1,097	0.9	965	0.9	473	0.9
Cerrado	5,023	4.3	4,256	4.1	2,076	4.1
Atlantic Forest	1,529	1.3	1,552	1.5	760	1.5
Pampa	241	0.2	167	0.2	82	0.2
Pantanal	563	0.5	551	0.5	269	0.5
Total	**117,856**	**100**	**103,537**	**100**	**51,014**	**100**

Visit:
http://snif.florestal.gov.br/pt-br/estoques-das-florestas.

Measurement of diameter at breast height(DBH) - Laranjeiras/State of Paraná

Aerial view of the Jacundá National Forest - Rondônia

FOREST POLICIES AND MANAGEMENT

Policies and Institutions

Forest Management Institutions

Forest Management in Brazil involves different institutions and it is share among the three levels of government: federal, state and municipal. At **Federal Government** level, forest management lies under the direct responsibility of four institutions.

The **Ministry of Agriculture, Livestock and Food Supply (MAPA)** is responsible for coordinating, planning, implementing and evaluating the agricultural policy for forest plantations. www.mma.gov.br

The **Ministry of the Environment (MMA)** is responsible for granting the rights for the sustainable production in federal public forests under concession contracts. www.mma.gov.br

BRAZILIAN FOREST SERVICE

The **Brazilian Forest Service (SFB)** is the managing agency of federal public forests for sustainable production of goods and services. It also holds the responsibility of generating information, training and fostering the forest sector. www.florestal.gov.br

Meeting of the Public Forest Management Commission (CGFLOP) - Brasília / DF

The **Brazilian Institute of Environment and Renewable Natural Resources (Ibama)** is the agency responsible for environmental licensing, monitoring, controlling and inspection. www.ibama.gov.br

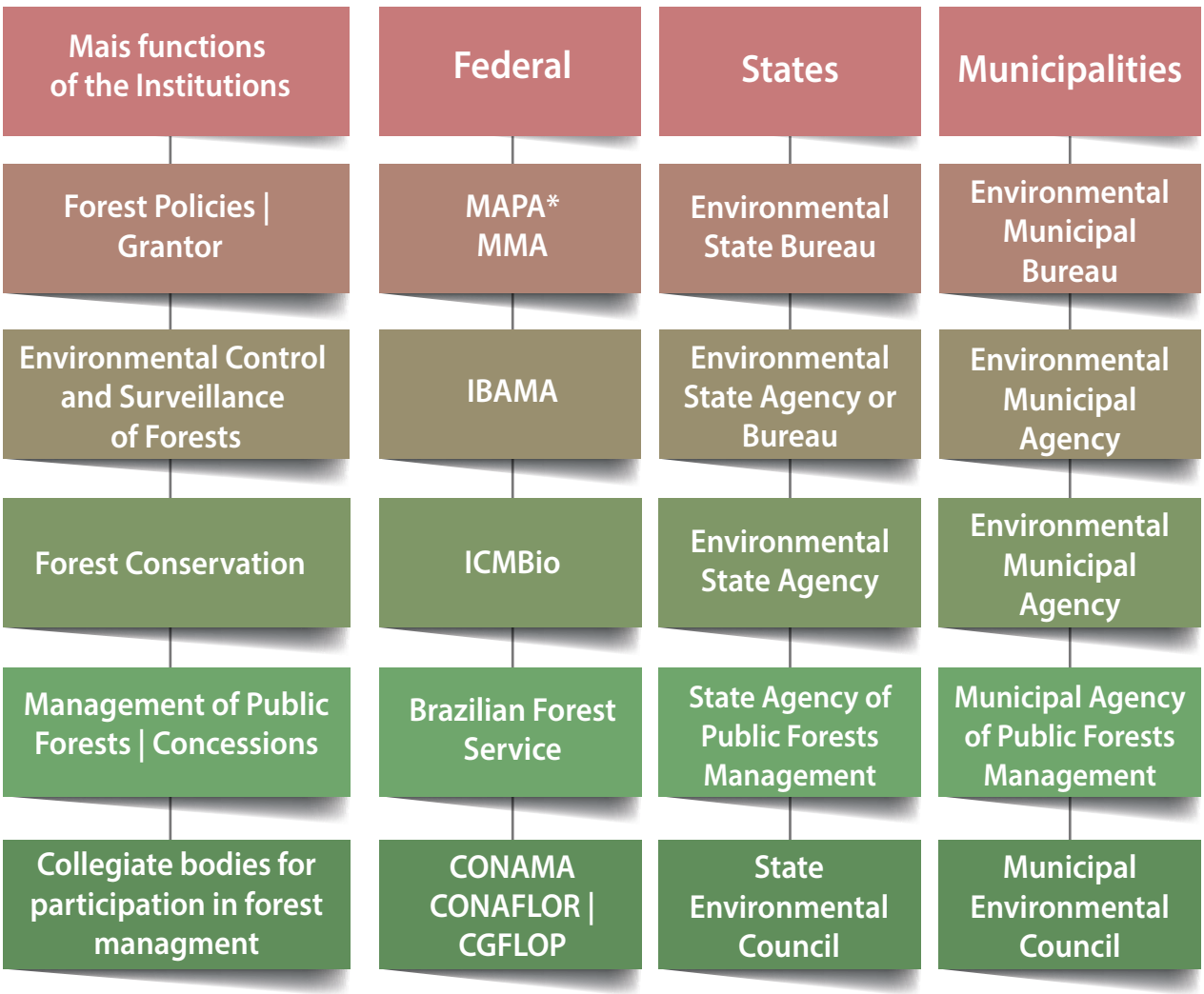
The **Chico Mendes Institute for Biodiversity Conservation (ICMBio)** is the institution responsible for proposing, implementing, managing, monitoring and protecting the federal Conservation Units. www.icmbio.gov.br

Social participation in forest management occurs through public hearings and consultations held in local communities, according to specific situations provided by law. This important tool also counts with the collegiate participation in the decision-making processes of forest management:

The **National Environmental Council (Conama)** is the consulting body that deliberates on the National Environmental System (SISNAMA). It is a collegiate body which represents federal, state and municipal environmental agencies, the private sector and civil society.

The **Public Forest Management Comission (CGFLOP)** is the advisory body of the Forest Service whose purpose is to advise, assess and propose guidelines for the management of public forests in Brazil.

Figure 14 - **Institutional arrangement for forest management in the governmental spheres**



* Ministry of Agriculture, Livestock and Food Supply.

Forest Legislation

Native Vegetation Protection Law

Law 12,651, of May 25th, 2012, provides for the protection of native vegetation and repeals the Forest Code, Law No. 4,771, of September 15, 1965, and the regulations that amended it. Establishes general regulations on the protection of vegetation, Permanent Preservation Areas and Legal Reserves; forest exploitation; supply of forest resources; forest products chain of custody; control and prevention of forest fires; and provides economic and financial tools to achieve its goals.

Some highlights among the principles and provisions of this law are:

- ✓ Creation of policies for the preservation and restoration of native vegetation and its ecological and social functions;
- ✓ Compatibility and harmonization between the productive use of land and the preservation of water, soil and vegetation;
- ✓ Delimitation and protection regime of the Permanent Preservation Areas - PPA and Legal Reserves - LR;
- ✓ Creation of the Rural Environmental Registry – CAR;
- ✓ Suppression of native vegetation for land use chan-

ges, based on CAR;

- ✓ Exploitation of native forests and successive formations, dependent on a Sustainable Forest Management Plan - SFMP;
- ✓ Need for a Sustainable Supply Plan - SSP;
- ✓ Chain of custody of forest products and by-products;
- ✓ Establishment of the National Policy on Management and Control of Burnings, Prevention and Combat of Forest Fires;
- ✓ Program for supporting the payment for environmental services, restoration, , conservation and sustainable use of forests;
- ✓ Institution of the Environmental Reserve Quota – CRA;
- ✓ Embargo of construction or activity that causes deforestation;
- ✓ Intervention and suppression of vegetation in PPA and LR on small family ownership or rural property;
- ✓ Environmental Regularization Program - PRA;
- ✓ Implementation of the National Forest Inventory– NFI.

Visit:
http://snif.florestal.gov.br/pt-br/legislacao-florestal

Public Funds to Support Projects

Amazon Fund

The Amazon Fund, instituted by Decree No. 6,527, of August 1, 2008, aims to raise donations for non-reimbursable investments to prevent, monitor and combat deforestation and promote the conservation and sustainable use of forests in the Amazon biome.

Despite its main focus, the Amazon Fund also promotes the implementation monitoring and control systems for deforestation in other Brazilian biomes and in other tropical countries.

Between 2009 and 2018, 103 projects were supported with a total value of R$ 1,877,644,965.

Visit:
http://www.fundoamazonia.gov.br/pt/home/

Climate Fund

The Climate Fund, created by the Law No. 12,114, in 12/09/2009, and regulated by Decree No. 7,343, in 10/26/2010, is a tool from the National Policy on Climate Change, that has the main goal of financing projects, researches and ventures aiming to reduce greenhouse gas emissions and adapt to the effects of climate change. The Climate Fund is vinculated to the Ministry of Environment (MMA) and grants reimbursable and non-reimbursable funds.

From 2011 to 2018, 34 projects were financed, with an estimate total value of R$ 58,318,603.

Visit:
http://www.mma.gov.br/clima/fundo-nacional-sobre-mudanca-do-clima

National Fund for Forest Development (FNDF)

The National Fund for Forest Development is a public fund, financial in nature, created by the Public Forest Management Law (11,284/2006), and it aims at fostering the development of forest-based sustainable activities in Brazil.

The primary applications of FNDF are listed on §1 of art. 41 of the Public Forest Management Law. To ensure transparency and public monitoring, FNDF actions are overseen by an Advisory Board.

From 2010 to 2017, FNDF financed 146 projects in the biomes Caatinga (71% of the projects), Amazon (14%), Atlantic Forest (12%) and Cerrado (3%), with a total sum of R$ 21,879,301. This budget comes from several sources, including Brazilian Forest Service's own budget, the percentages of forest concession contracts, the Climate Fund (FNMC) and the CAIXA Socio-environmental Fund (FSA / CEF).

Visit:
http://www.florestal.gov.br/fndf

National Environment Fund (FNMA)

The National Environmental Fund (FNMA) is the oldest fund in Latin America created by Law 7,797 of July 10, 1989. The FNMA is a unit of the Ministry of the Environment (MMA) with the mission of contributing, as financing agent, through social participation, for the implementation of the National Environmental Policy - PNMA.

Between 1990 and 2017, 250 projects were supported, with an estimated value of R$ 101,731,934.

Visit:
http://www.mma.gov.br/fundo-nacional-do-meio-ambiente

Training in the semi-arid region - Northeast region

Information Systems for Forest Management

snif

National Forest Information System – NFIS

The creation and management of the National Forest Information System (NFIS) is a competence of the Brazilian Forest Service provided by Law No. 11,284/2006.

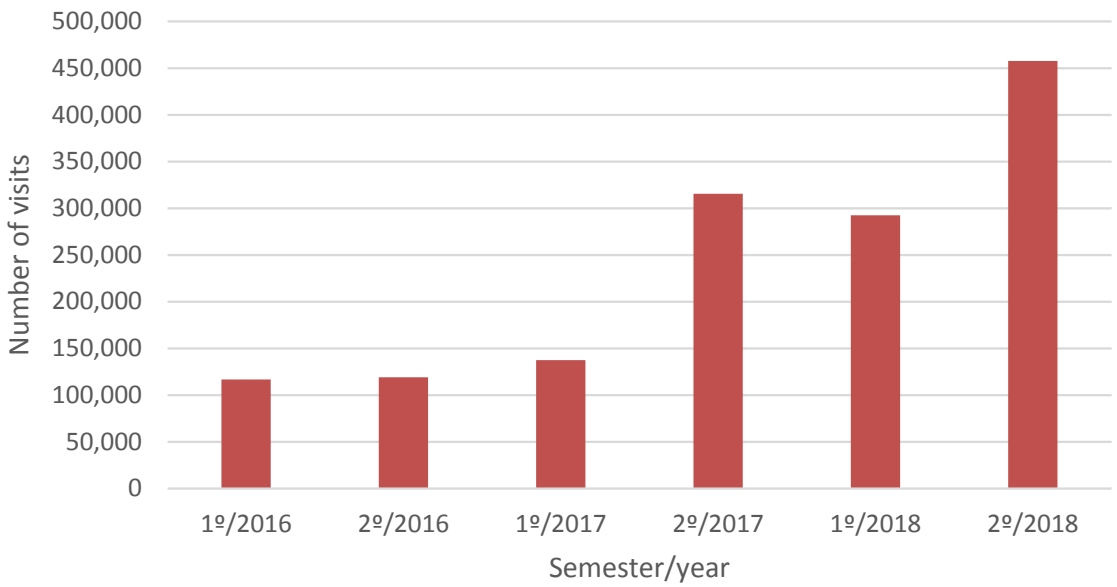
The NFIS is a national base of forest information, composed by collecting, producing, treating, organizing, storing, processing and disseminating data, information and knowledge on forest related issues, from diverse sources, which allows easy access to all interested parties.

Its main information axes are: **Forest Resources** (information provided by several institutions and by the National Forest Inventory - NFI), **Forest Management** (information provided by SISNAMA agencies), **Forest Production** (information produced by the forest sector and federal institutions, including exploration, production, consumption and market), **Education and Forest Research** (information collected in education institutions and forest research centers).

The NFIS has a national scope, but allows performance at different scales (biomes, states, municipalities, watersheds, etc.) and applications, in order to subsidize the sustainable use, conservation and restoration of Brazilian forests.

Information from the NFIS is also a reference for international reporting, such as the FAO Forest Resources Assessments, and the Forest Sector Questionnaire, of the International Tropical Timber Organization - ITTO.

Graphic 2 - **Number of visits on NFIS website**



Visit:
http://snif.florestal.gov.br/pt-br/

National System of Chain of Custody of Forest Based Products - Sinaflor

The National System of Chain of Custody of Forest Based Products integrates the chain of custody control of timber, charcoal and other forest products or by-products, under the coordination, supervision and regulation of Ibama. Sinaflor was established by Normative Instruction No. 21, of December 24, 2014.

Forestry activities, forest-based enterprises and correlated processes subject to control by the National Environmental System (Sisnama) will be carried out by Sinaflor.

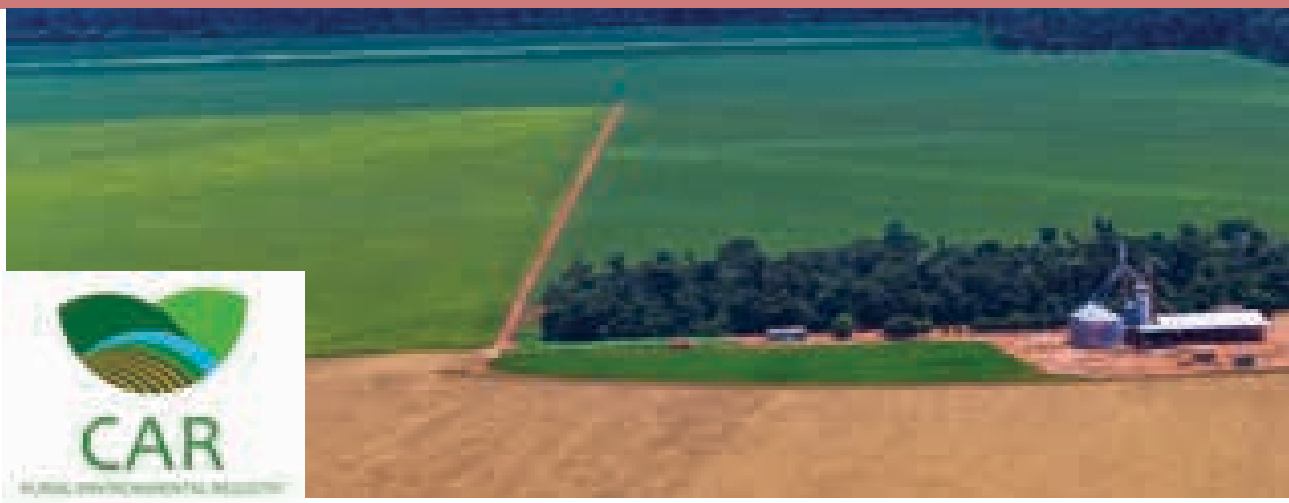
Visit:
http://www.ibama.gov.br/flora-e-madeira/sinaflor/sobre-o-sinaflor

Brazilian Biodiversity Information System – SiBBr

The Ministry of Science, Technology, Innovation and Communication (MCTIC) has created the Brazilian Biodiversity Information System, with technical support from the United Nations Environment Programme (UNEP) and financial support from the Global Environment Fund (GEF).

The system is an online platform that intends to gather the largest amount of existing data and information about biodiversity in Brazil. It aims to support academic and scientific production, as well as public policies, formulation, and decision-making processes associated with environment conservation and sustainable use of natural resources, by means of encouragement and ease of digitalization, online publishing, free access data integration and use of information about Brazilian biodiversity.

Visit:
http://www.sibbr.gov.br



Rural Environmental Registry (CAR)

The Rural Environmental Registry (CAR) was created by the Law No. 12,651/2012. It is a national public electronic registry, mandatory to all rural properties, and aims to integrate the environmental information about all those rural properties, legal or not. This database will allow more efficient planning, monitoring and controlling of economic activities in rural areas.

In order to manage the environmental information of rural properties in the country, a national electronic data system was created, the Rural Environmental Registry System - SiCAR (Decree No. 7,830, of October 17, 2012).

The SiCAR has the following goals:

a. Receive, manage and integrate CAR data from all

Rural property - State of Mato Grosso

the federal entities;

b. Register and control information about rural properties: perimeter and location, native vegetation remnants, social interest areas, public use areas, Permanent Preservation Areas, Restricted Use areas, consolidated areas and Legal Reserves;

c. Monitor the conservation, natural regeneration, restoration, compensation and suppression of native vegetation, as well as the Permanent Preservation, Restricted Use and Legal Reserve areas inside rural properties;

d. Promote environmental and economic planning of land use nationwide;

e. Provide online public information about environmental regularization of rural properties nationwide.

Visit CAR website:
http://www.car.gov.br

Table 14 - **CAR estimates**

Region	Area eligible to be registered	Registered Area	Registered Properties	Percentage of Registered Area
Midwest	129,889,570	127,339,305	412,124	98.04%
Northeast	76,074,156	72,782,093	1,574,745	95.67%
North	93,717,515	137,569,971	694,372	>100%
Southeast	56,374,996	66,708,737	1,151,330	>100%
South	41,780,627	43,919,148	1,287,209	>100%
Subtotal[1]	**397,836,864**	**448,319,254**	**5,119,780**	**>100%**
Sustainable Use Conservation Units		30,754,914	22,484	
Total[2]	**428,591,779**	**479,074,168**	**5,142,264**	**>100%**

Source: CAR/SFB (2018).

Notes:

[1] Information from the Rural Environmental Registry System - SiCAR (31/12/2018); of the State systems of Mato Grosso do Sul (until 30/11/2018) and São Paulo (31/12/2018); considers the number of beneficiaries of Agrarian Reform Settlements as well as the number of families registered in Traditional Territories and Communities. Data do not include the areas registered in the Nature Conservation Units of Sustainable Use, in which the traditional populations are allowed to remain.

[2] The information includes the data registered in SICAR referring to the Nature Conservation Units of Sustainable Use in which the traditional populations are allowed to remain.

National Public Forests Registry (CNFP)

The National Public Forests Registry (CNFP) is a tool for forest management planning. It gathers georeferenced data on Brazilian public forests, in order to offer to government agents and to the public a reliable database of maps, images and data with relevant information to forest management. Its procedures are set by Resolution No. 02 of July 6, 2007 of the Brazilian Forest Service.

Public Forest areas in Brazil are in a permanent process of identification and registry by the Brazilian Forest Service, and data from CNFP help the processes of forested land designation to community use, new conservation units or to forest concessions. The Registry contributes for the transparency, social participation and consolidate information on public forests.

The Public Forests that are part of the National Public Forests Registry encompass an area of 309.2 million ha, which represents 37% of Brazil's territory. Brazilian public forests are distributed in the different biomes and regions of the country. However, most of them (92%) are located in the Amazon Biome.

Visit:
http://www.florestal.gov.br/cadastro-nacional-de-florestas-publicas

National Registry of Conservation Units - CNUC

Protected areas are territorially demarcated spaces, legally established, in order to preserve or conserve nature and cultural values associated with it. In Brazil, protected areas can be public or private. The main public protected areas are Indigenous Lands and conservation units. Private protected areas are mainly Legal Reserves and Permanent Preservation areas, established by the Law No.12,651, of May 25, 2012, which regulates the protection of native vegetation.

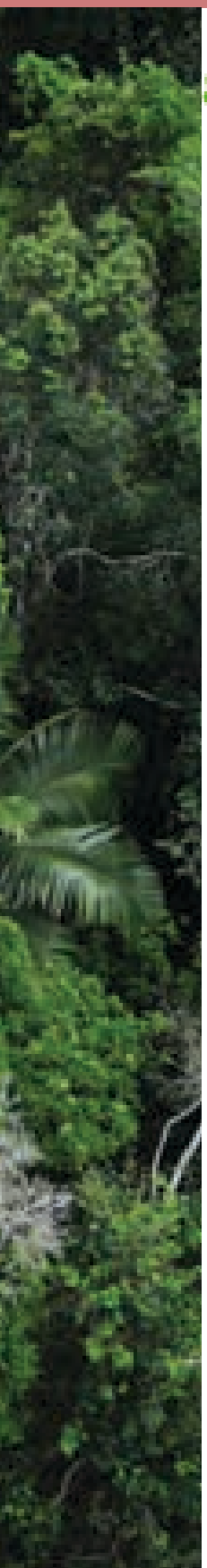
Conservation Units are divided in different categories, according to their objectives, defined by the Law No. 9,985, of July 10, 2000, which instituted the National Conservation Units System (SNUC). There is, however, one category in SNUC for private properties, the Private Natural Heritage Reserve - RPPN, which can be created voluntarily by private property owners.

Visit:
http://www.mma.gov.br/areas-protegidas/cadastro-nacional-de-ucs

Chapada dos Veadeiros National Park - State of Goiás

Forest Monitoring

Atlantic Forest in São Pedro da Aldeia - State of Rio de Janeiro



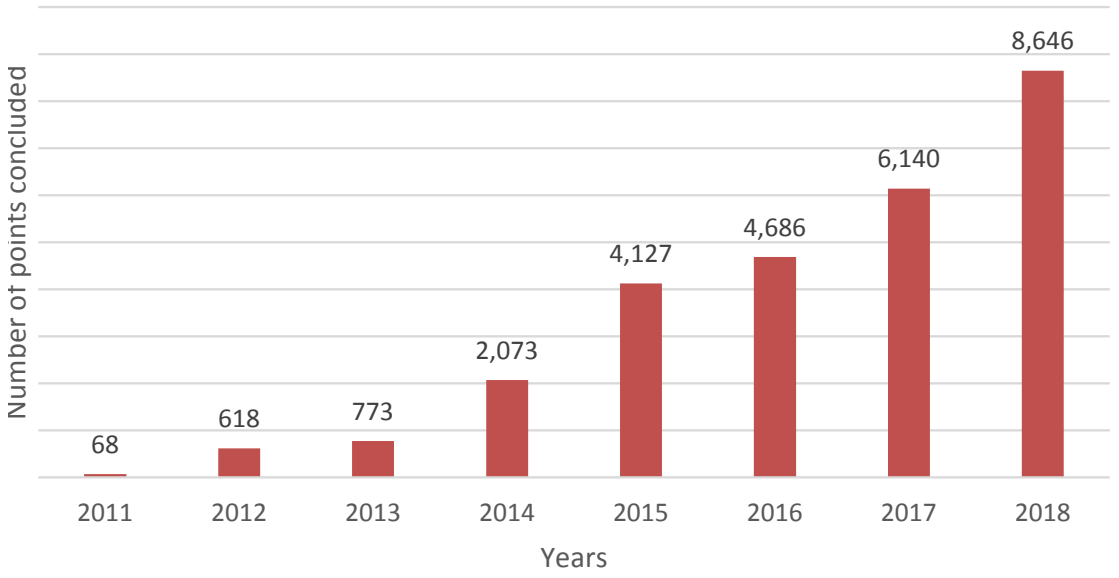
National Forest Inventory of Brazil

The NFI is coordinated by the Federal Government and implemented through partnerships with state and municipal governments, as established in Article 71 of Law No. 12,651 of May 2012, which states that "the Union, together with the States, Federal District and Municipalities, will carry out the National Forest Inventory, to subsidize the analysis of forests existence and quality nationwide, in private properties and public land.

The National Forest Inventory - NFI is coordinated by the Brazilian Forest Service and it aims at producing strategic information about the country's forest resources.

The NFI's methodology has a national standardization, with possible adaptations to the peculiarities of Brazilian biomes. The methodology consists on gathering biophysical, socio-environmental and landscape information in a systematic grid of sample points measuring 20 km x 20 km, and covering the entire national territory at intervals of 5 years.

Graphic 3 - **Number of sample units completed by the NFI per year (cumulative)**

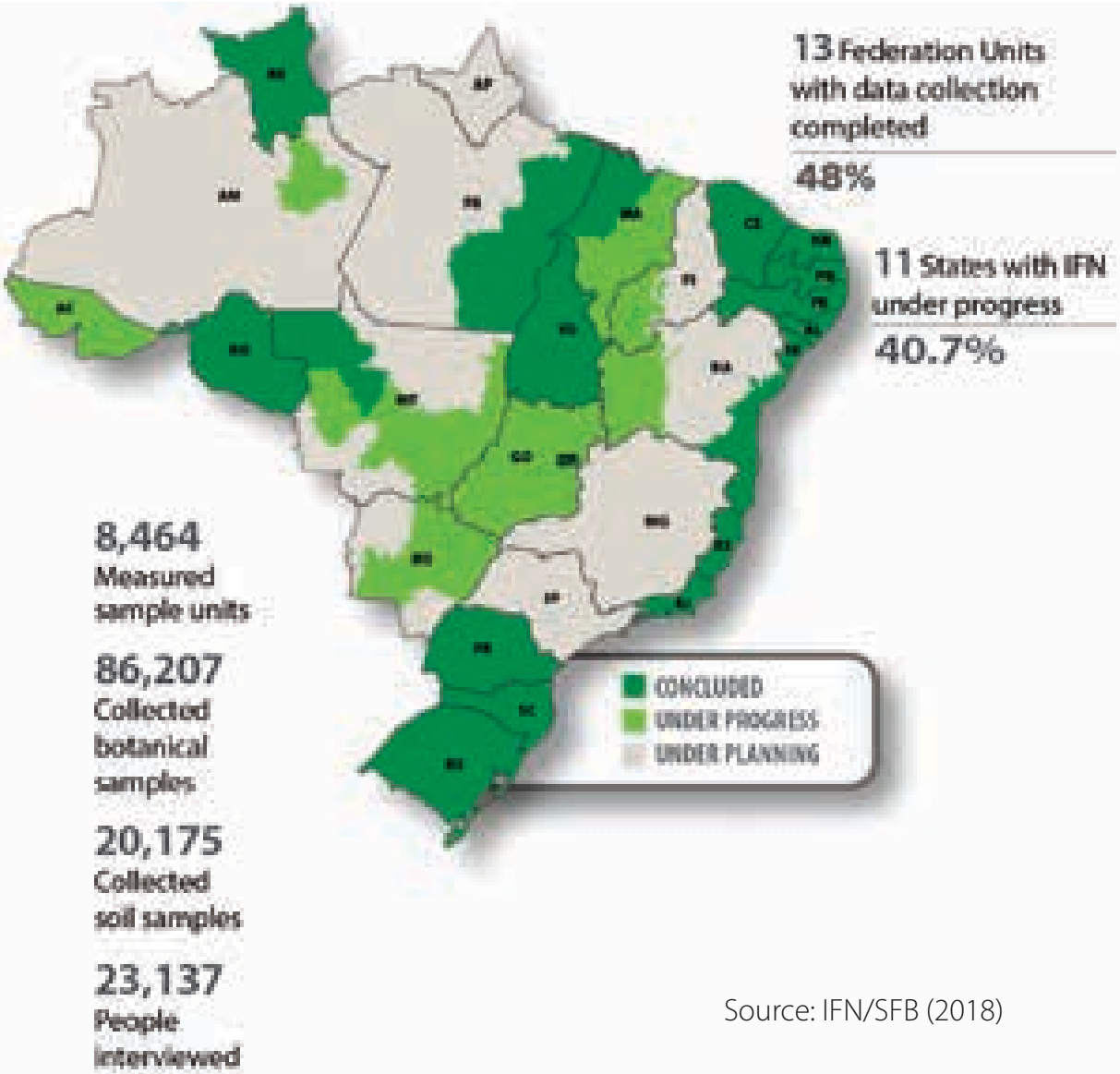


Source: IFN/SFB (2018).

National Park of Aparados da Serra - State of Rio Grande do Sul

NFI Implementation

Figure 15 - **National Forest Inventory Implementation, situation in 2018**



Source: IFN/SFB (2018)

Visit:
http://www.florestal.gov.br/inventario-florestal-nacional

Deforestation and Degradation of Forests

Deforestation

Deforestation is the total suppression of native vegetation of a particular area for alternative land use. In this process, the forest cover is totally removed and replaced by other coverages and uses (agricultural, pasture, urban, water reservoir, etc.). (INPE, 2013).

Monitoring natural forest cover loss in Brazilian biomes has been done using satellite images, with the support of different projects, among them:

- **Monitoring Program of Brazilian Biomes by Satellite (PMDBBS)** Carried out by the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA) for actions to control and combat illegal deforestation;
- **Forest Satellite Monitoring Project (PRODES)** Carried out by the National Institute for Space Research (INPE) in the Legal Amazon and Cerrado, to measure annual deforestation rates;
- **Atlas of the Atlantic Forest Remnants** An agreement between the SOS Mata Atlântica Foundation and the National Institute for Space Research (INPE) for Monitoring the Atlantic Forest;

- **Environmental Monitoring Program of the Brazilian Biomes (PMABB)** A partnership among the Ministry of the Environment - MMA, INPE, Embrapa and IBAMA to monitor the Brazilian biomes.

Table 15 - **Projects to monitor deforestation in different biomes, with their respective years of reference**

	Amazon	Caatinga	Cerrado	Atlantic Forest	Pampa	Pantanal
PMDBBS	<2002	<2002	<2002	<2002	<2002	<2002
	2002-2008	2002-2008	2002-2008	2002-2008	2002-2008	2002-2008
	2008-2009	2008-2009	2008-2009	2008-2009	2008-2009	2008-2009
		2009-2010	2009-2010			
		2010-201	2010-201			
PRODES	1988-2018		2000-2018		2016	2016
SOS MA				2005-2016		

Deforested area in the Amazon biome

Amazon

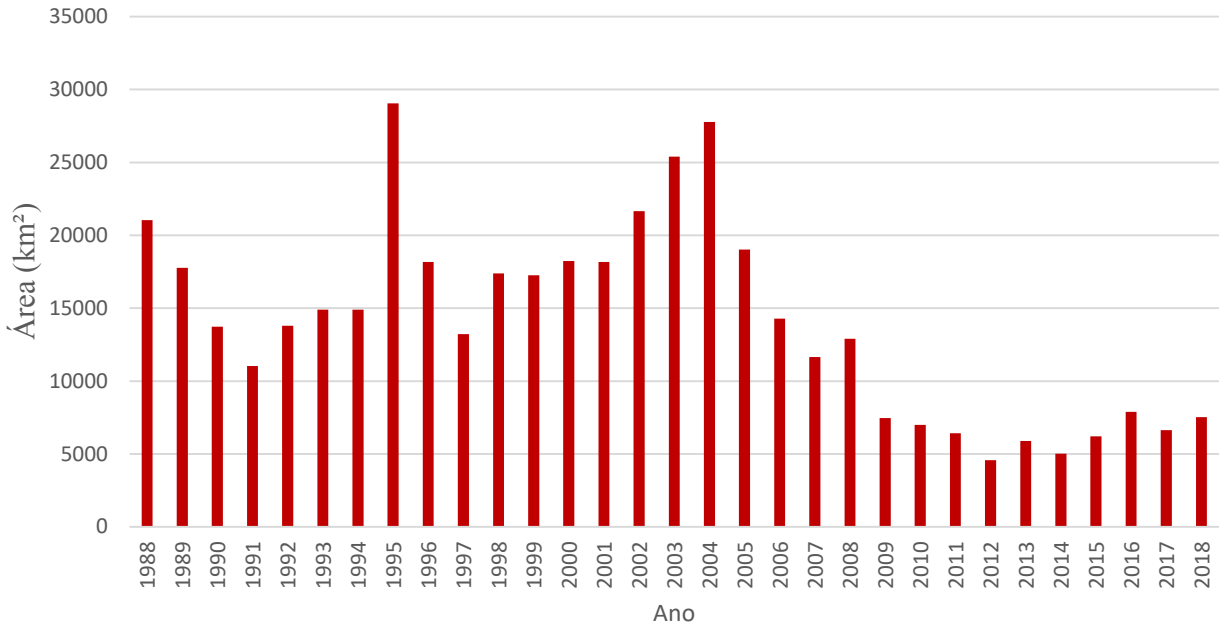
The National Institute for Space Research (INPE) is monitoring the Amazon's forest cover by satellites, based on the outputs of three operational systems: PRODES, DETER and DEGRAD. These systems are complementary to each other and are designed to meet different purposes.

Prodes

The Amazon Forest Satellite Monitoring Project (Prodes) uses Landsat satellite images to measure annual deforestation rates, since 1988, considering deforestation in the areas exceeding 6.25 hectares. It analyses deforestation clear cut that result in the complete removal of the forest cover.

Between August 2017 and July 2018, the deforastation rate increase in 13.7% , with approximately 7,900 km2 of deforested area in the Legal Amazon.

Graphic 4 - **Annual deforestation rate of the Legal Amazon (PRODES)**



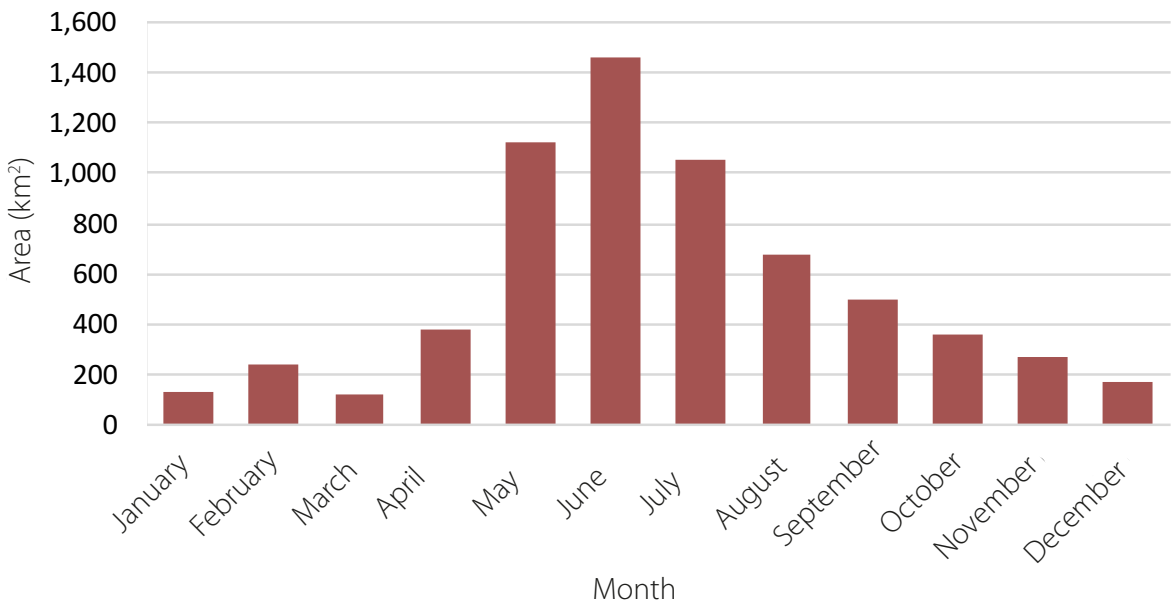
Source: INPE (2018a).

Deforested area in the Amazon biome - AM

Deter

The Real Time Deforestation Detection System (DETER), developed by INPE in 2004, is a quick survey of evidence alerts of forest cover change in the Amazon and uses data from the MODIS sensor. It was developed as an alert system to support the surveillance and control of deforestation and illegal forest degradation by IBAMA, detecting changes in forest cover within areas of more than 25 hectares.

Graphic 5 - **Average monthly area of deforestation alerts in the Brazilian Amazon (DETER) (2004 - 2018)**

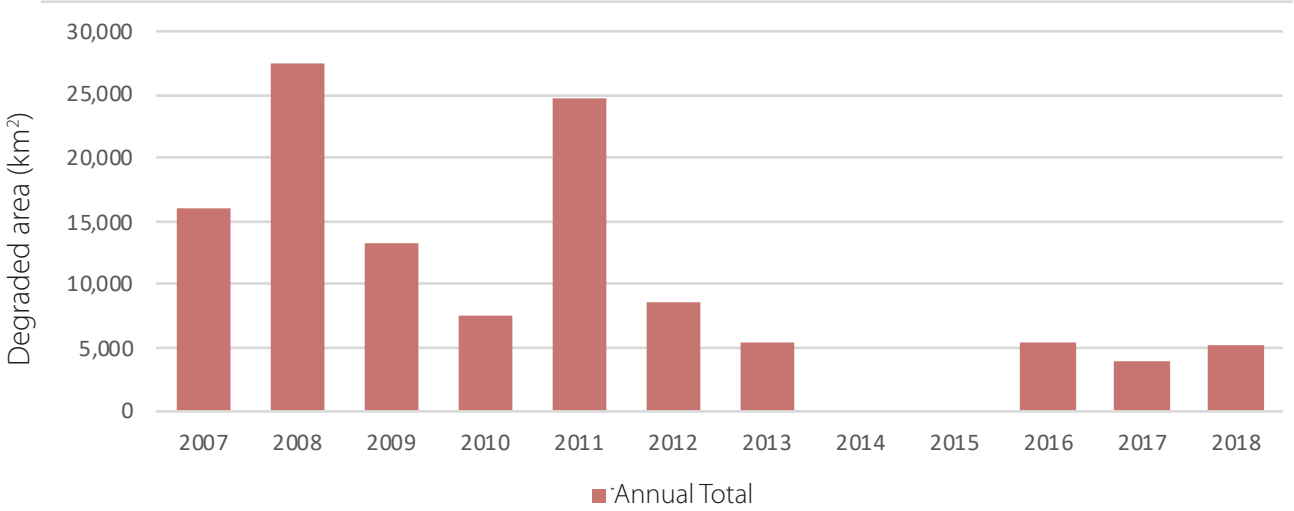


Source: INPE (2019).

Degrad

The Degrad System, developed by INPE in 2007, uses LANDSAT and CBERS satellite images to annually quantify forest areas undergoing degradation, where forest cover has not been completely removed. Degrad mapped forest degradation in the Amazon between 2007 and 2013, based on the same set of approximately 220 LANDSAT images processed for PRODES. Since 2016, degradation has been measured by the DETER-B system.

Graphic 6 - **Area of forest degradation in Brazilian Amazon**

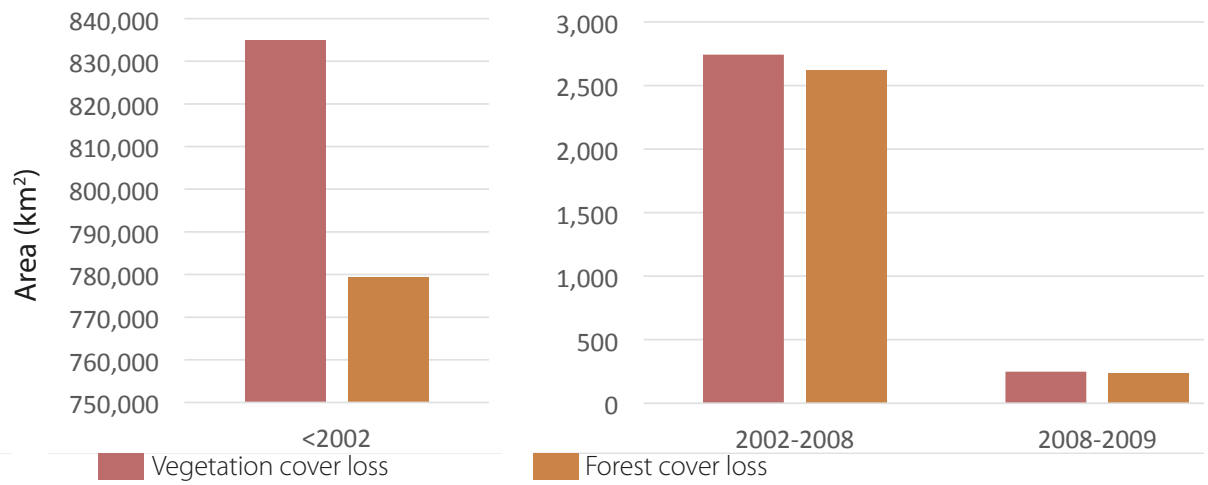


Source: INPE (2019).

Atlantic Forest

According to the Monitoring Program of Brazilian Biomes by Satellite (PMDBBS), from 2002 to 2008 2,742 km² of the vegetation cover from the Atlantic Forest were deforested and from 2008 to 2009, another 248 km². Considering only the deforestation of forest areas, it drops to 2,616 km² and 233 km².

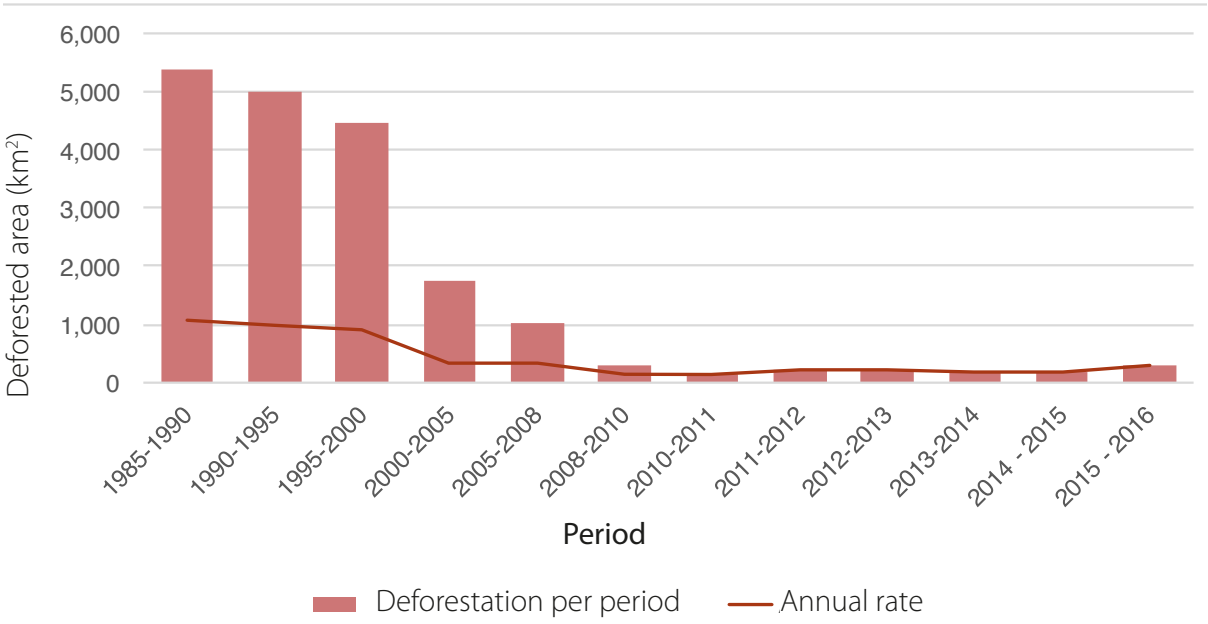
Graphic 7 - **Vegetation cover loss in the Atlantic Forest, per period**



Source: PMDBBS/IBAMA (2012).

The NGO SOS Mata Atlântica, partnered with INPE, has been monitoring the Atlantic Forest biome deforestation by means of the Atlas of the Atlantic Forest Remains. The first monitored period was from 1985 to 1990, and it registered the deforestarion of 536,480 ha (5,365 km²). In 2015-2016 survey, this number went down to 29,075 ha (291 km²). They monitor parts of the biome in the following states: Alagoas, Bahia, Ceará, Espírito Santo, Goiás, Minas Gerais, Mato Grosso do Sul, Paraíba, Pernambuco, Piauí, Paraná, Rio de Janeiro, Rio Grande do Norte, Rio Grande do Sul, Santa Catarina, Sergipe and São Paulo.

Graphic 8 - **Deforestation in the Atlantic Forest per period**



Source: Foundation SOS Mata Atlântica; INPE (2018).

The scales of these two mappings are different: the concept of "remain" adopted in MMA's mapping is broader, it includes secondary vegetation; and the domain of Atlantic Forest used in the SOS Mata Atlântica Atlas is bigger and includes fragmented areas.

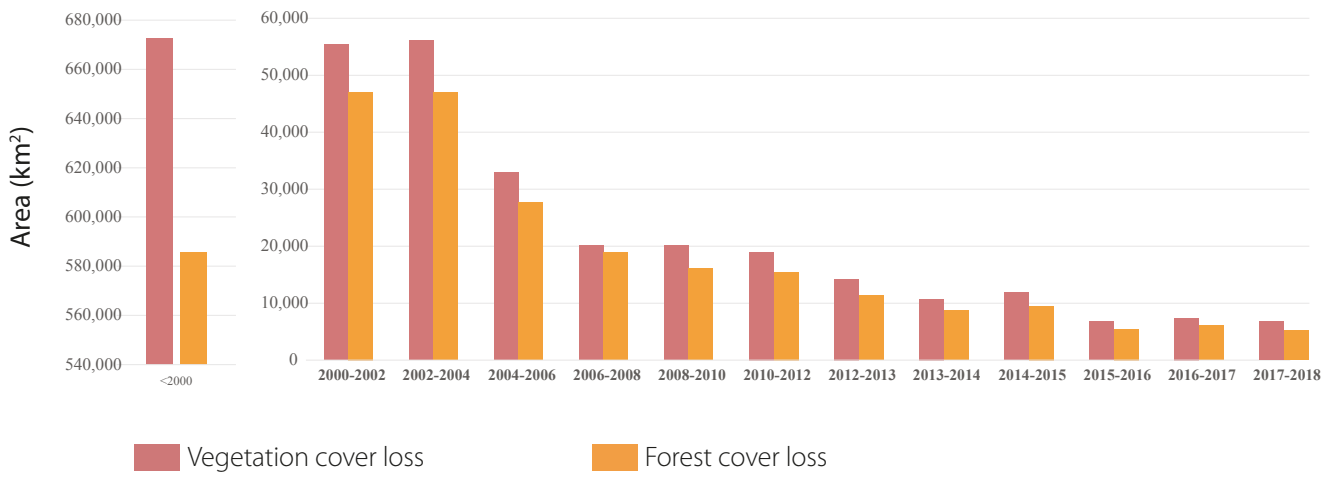
PMDBBS mapping utilized the remains from the Vegetation Cover of the Brazilian Biomes Maps (MMA, 2006) which indicate 22.44% of forest remains. This total considers areas above 15 ha, including native vegetation and well-developed secondary vegetation.

Atlantic forest biome - Serra da Garganta, Santa Terezinha - State of Santa Catarina

Cerrado

The National Institute of Space Research (INPE) carried out the Prodes Cerrado project, to map deforestation on the entire extent of the Cerrado. Through the project was built a biennial series of the anthropic removal of natural vegetation for the period 2000 to 2012 and annually for the years of 2013 to 2018.

Graphic 9 - **Vegetation cover loss in the Cerrado, per period**

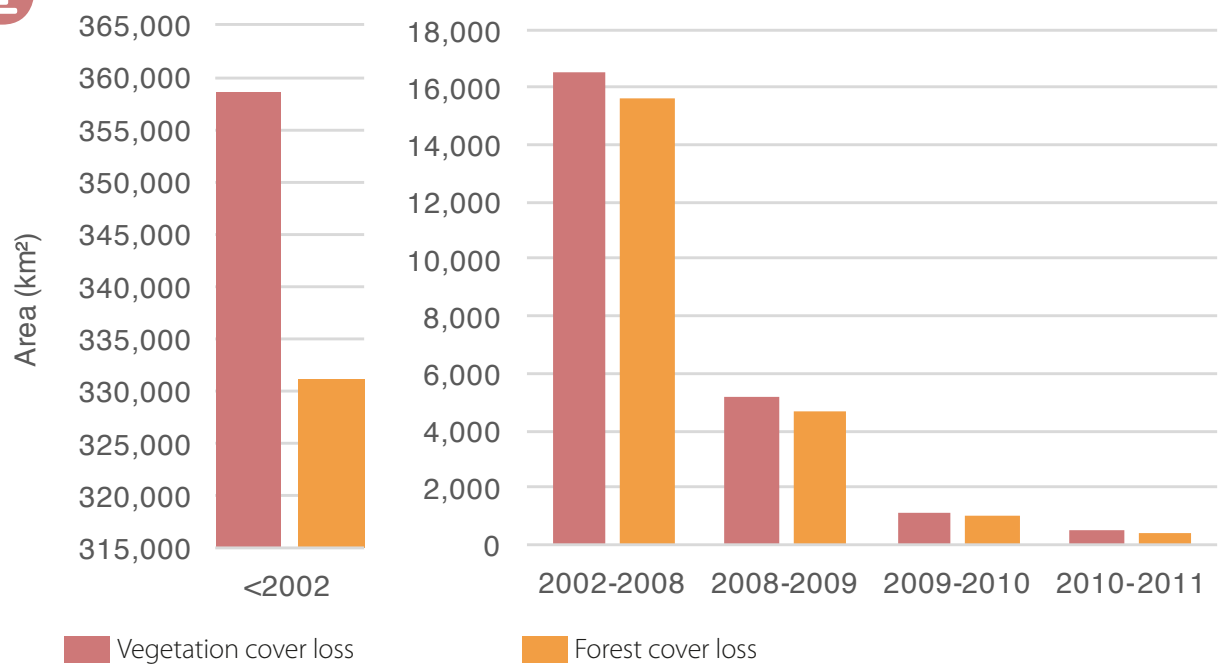


Source: PRODES Cerrado/INPE (2019).

Caatinga

Within the scope of the Program for Monitoring Deforestation in the Brazilian Biomes by Satellite (PMDBBS), between 2002 and 2008 approximately 16,576 km² of vegetation cover suppression were mapped in the Caatinga, an average of approximately 2,763 km² deforested annually in that period. For the following periods, 2008-2009, 2009-2010, 2010-2011, it is estimated a cover loss of 1,921 km², 1,134 km² and 495 km², respectively.

Graphic 10 - **Vegetation cover loss in the Caatinga, per period**



Source: PMDBBS/IBAMA (2011).
Note: The graphs show the area values calculated from the shapes made available as PMDBBS results. There are differences between these calculated areas and the figures disclosed in the consolidated MMA reports.

Other Biomes

The Pampa and Pantanal biomes, in the scope of the Program for Monitoring Deforestation in the Brazilian Biomes by Satellite (PMDBBS), were also mapped regarding the deforestation situation for the period between 2002-2008, 2008-2009 and INPE for period between 2000-2016.

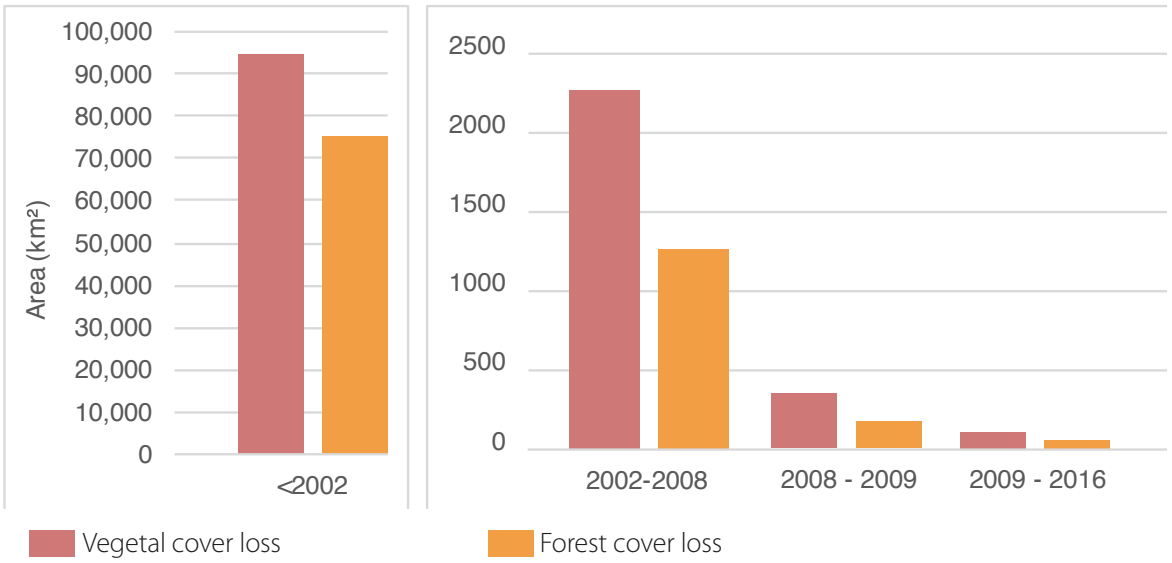
Table 16 - **Deforested area in the Pampa and Pantanal biomes, in km²**

Biome	2002-2008	2008-2009	2009-2016
Pampa	2,179	331	105
Pantanal	4,279	188	62

Source: PMDBBS/IBAMA, 2011 e INPE, 2019.

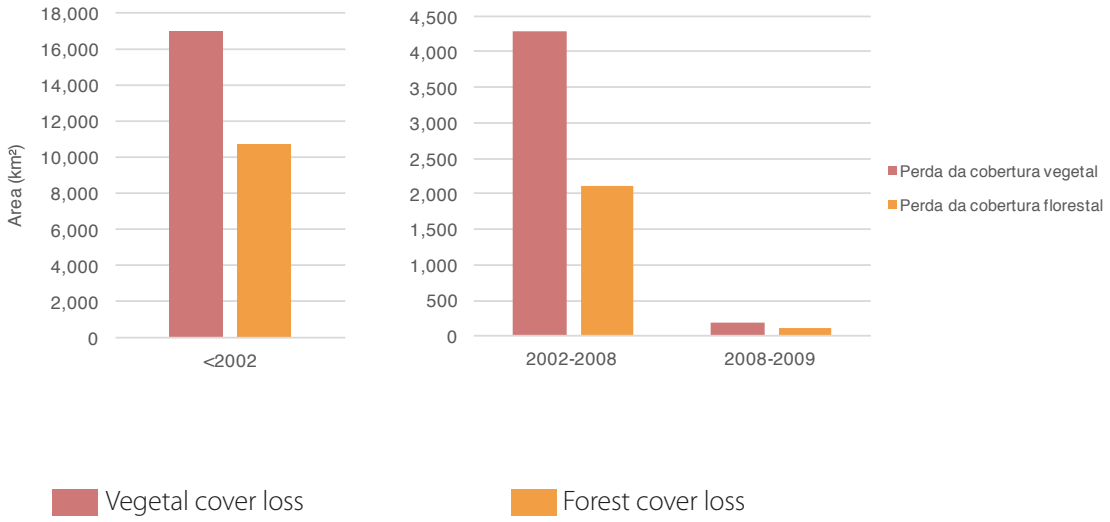
Wildlife Refuge Banhado dos Pachecos - State of Rio Grande do Sul

Graphic 11 - **Vegetation cover loss in the Pampa, per period**



Source: PMDBBS/IBAMA, 2011 e INPE, 2019

Graphic 12 - **Vegetation cover loss in the Pantanal, per period**



Source: PMDBBS/IBAMA (2011)

Visit:
http://snif.florestal.gov.br/pt-br/perda-da-cobertura-florestal

Area of Cerrado after forest fires - State of Tocantins

Forest Fires and Burnt Areas Monitoring

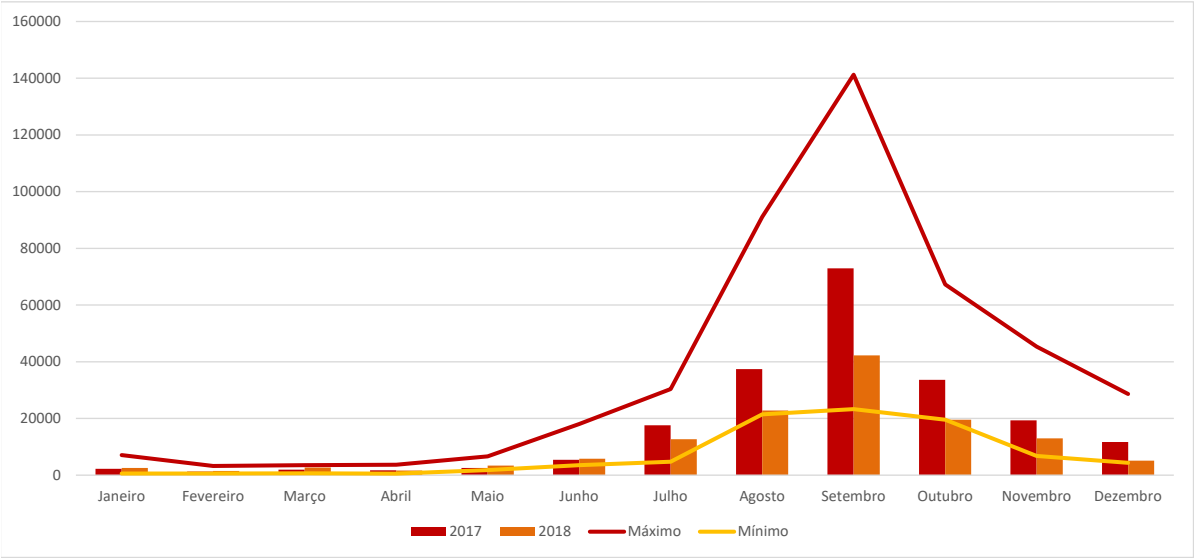
The monitoring of heat spots and forest fires by satellite, and the calculation and forecast of the risk of fire are part of the Monitoring Program of Forest Fires and Burnt Areas, developed by the National Institute for Space Research (INPE). This system started operating in 1986 during a conjoint field experiment between INPE researchers and NASA. Is has evolved continually since 1987, when it started operating nationally, and it has improved especially after 1998, with the support of the national Proarco National Program, from Ibama, created to control burnt areas and deforestation in the "arch of deforestation" in the Amazon, with resources from the Ministry of Environment.

Area with fires - State of Tocantins

Heat Spots

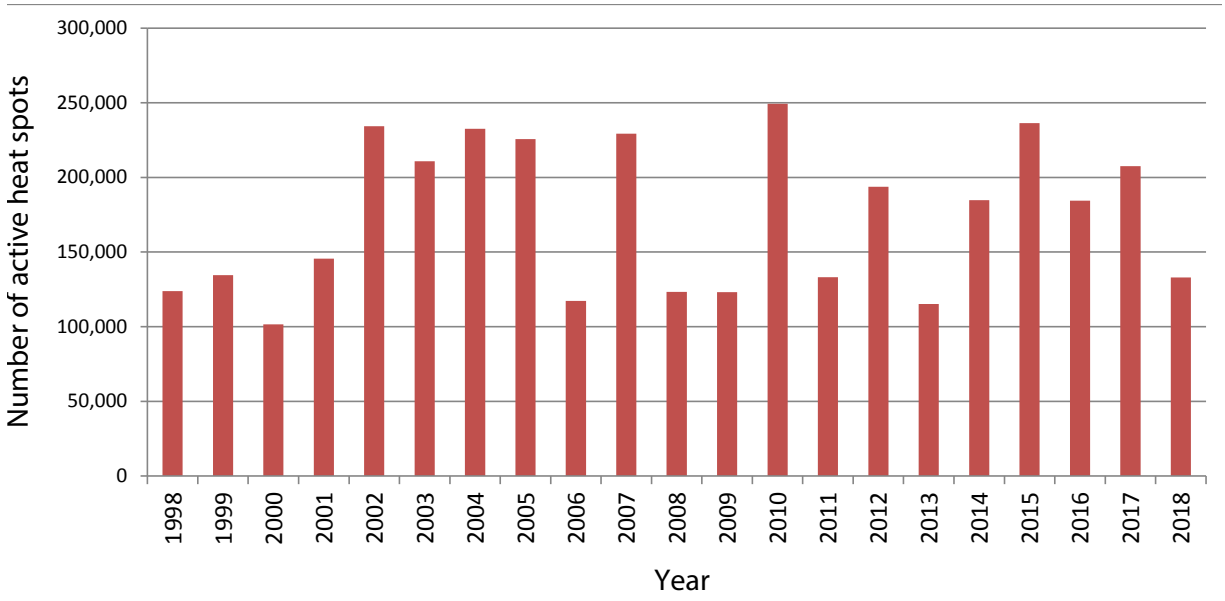
A heat spot indicates the existence of a fire in an element of image resolution (pixel) that varies from 1 km x1 km up to 5 km x 4 km. In this pixel there may be one or several different fires, that will be indicated as one heat spot. If the fire is too large, it may light other pixels, meaning that several heat spots will indicate one large fire.

Graphic 13 - **Monthly average of the maximum and minimum heat spot numbers between 1998 and 2018, as well as the monthly heat spot numbers for the years 2017 and 2018.**



Source: INPE (2019).

Graphic 14 - **Total annual heat spots detected in Brazil**



Source: INPE (2019).

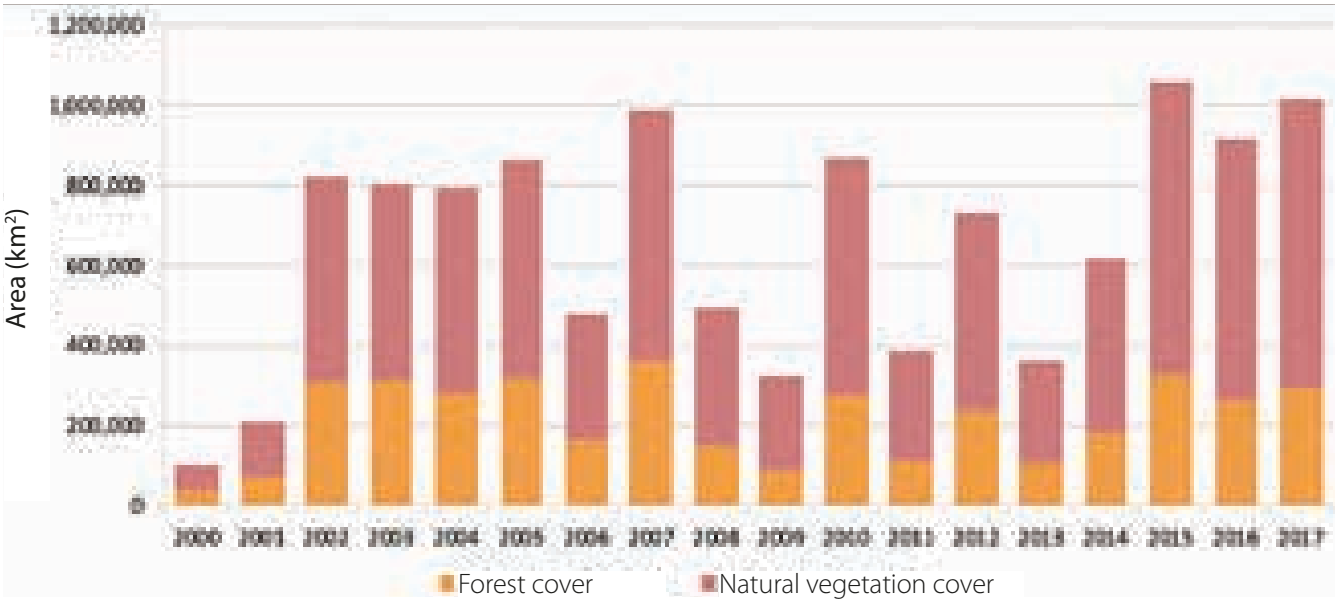
Visit:
http://snif.florestal.gov.br/pt-br/monitoramento-das-florestas

Fires and Burnt Areas

The products presented by INPE for Burnt Area aim to regularly detect and quantify the extension of the burnt vegetation area in the country using satellite images.

This monitoring technique utilizes images to estimate the burnt surfaces in the country, generating digital maps, temporal comparisons, and support products to help the assessment of the impact and the management of forest fires.

Graphic 15 - **Fires and burnt areas (km²), per natural vegetation cover and per year**



Source: INPE (2018d).

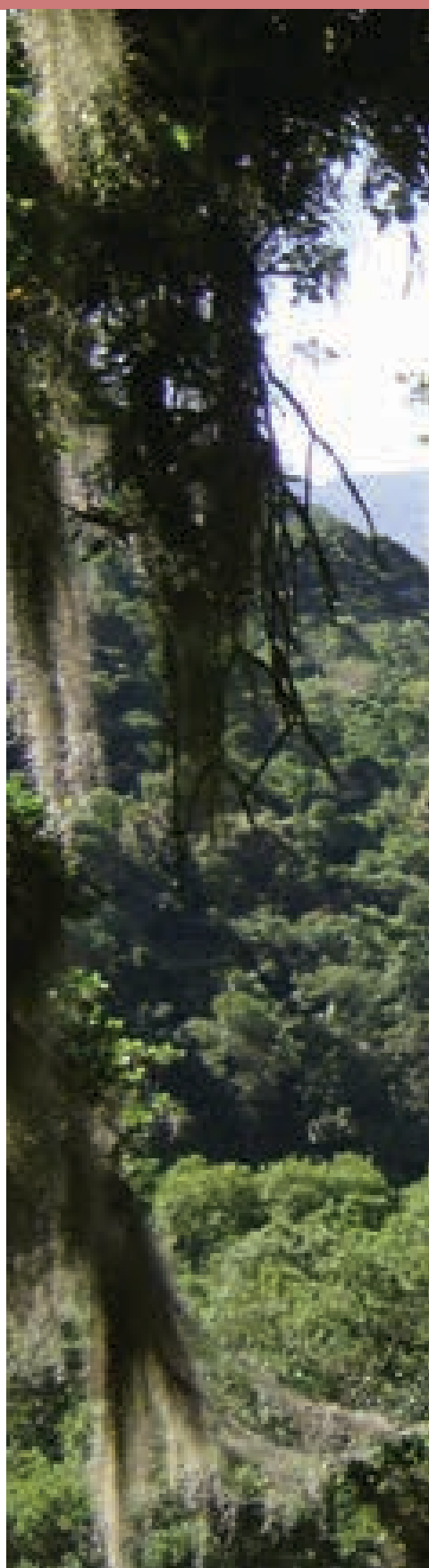
Forest Protection

Conservation Units

Conservation Units are defined as "territorial spaces and their environmental resources, including waters, with relevant natural attributes, legally instituted by the Government, with objectives of conservation and defined boundaries, under a special administrative regime, to which are applied adequate guarantees of protection" (SNUC Law).

The Conservation Units can be classified in two groups: Full Protection and Sustainable Use. Each group can be sub-classified into diverse categories according to different specific objectives.

The main objective of the Full Protection Areas is the preservation of nature, only allowing the indirect use of its resources. The basic objective of Sustainable Use Conservation Units is to combine both nature conservation and sustainable use of natural resources.



Rio Boi Hike -
State of Santa Catarina

Table 17 - **Situation of Federal Conservation Units**

Group	Category	No.	Area (ha)
Ful Protection	Ecological Station	30	7,208,800
	Natural Monument	5	11,531,400
	National Park	74	26,820,700
	Wildlife Refuge	9	298,400
	Biological Reserve	31	4,266,400
	Subtotal	**149**	**50,125,700**
Sustainable Use	Area of Environmental Protection	37	89,722,000
	Area of Relevant Ecological Interest	13	34,100
	National Forest	67	17,815,900
	Sustainable Development Reserve	2	102,600
	Extractivist Reserve	66	13,508,700
	Private Natural Heritage Reserve	670	488,500
	Subtotal	**855**	**121,671,800**
	Grand total[1]	**1004**	**171,797,500**

Source: MMA (2019).

Table 18 - **Situation of State Conservation Units**

Group	Category	No.	Area (ha)
Ful Protection	Ecological Station	60	4,749,500
	Natural Monument	32	96,100
	State Park	218	9,453,400
	Wildlife Refuge	52	317,900
	Biological Reserve	25	1,349,300
	Subtotal	**387**	**15,966,200**
Sustainable Use	State Forest	195	34,067,100
	Area of Environmental Protection	30	60,500
	Area of Relevant Ecological Interest	41	13,585,600
	Sustainable Development Reserve	32	11,125,000
	Extractivist Reserve	29	1,988,000
	Private Natural Heritage Reserve	250	84,300
	Subtotal	**577**	**60,910,500**
	Grand total[2]	**964**	**76,876,700**

Source: MMA (2019).
Note: Grand total[1] e Grand total[2]: including marine areas.

Visit:
http://snif.florestal.gov.br/pt-br/conservacao-das-florestass.

Indigenous Lands

Indigenous Lands are territories defined as: lands traditionally occupied and permanently inhabited by Indigenous peoples, which are used for their productive activities, and essential for the conservation of the resources their well-being and necessary for their physical and cultural reproduction, according to their uses, customs, and traditions". Although Indigenous peoples hold the permanent tenure, these lands are under federal government domain (BRASIL. CF, 1988).

The modalities of the Traditionally Occupied Indigenous Lands presented by FUNAI are the following:

- **Delimited:** those with anthropological report and limits approved by FUNAI;
- **Homologated:** those with demarcation homologated by the Presidency of the Republic;
- **Regularized:** those registered with the Registry of Real Estate and the Federal Heritage Department (SPU);
- **Interdicted:** those with restrictions of use and entry of third parties, for the protection of isolated indigenous peoples.

Table 19 - **Situation of Brazilian indigenous lands in 2018**

Modalidade		Quantidade	Área (ha)
Indigenous Reserve	Identification Report	15	6,868
	Regularized	35	71,359
	Interdicted	6	1,080,740
	Subtotal	**50**	**78,227**
Traditionally Ocuppied	Declared	73	7,602,655
	Delimited	43	2,219,513
	Homologated	13	1,497048
	Regularized	436	105,714,670
	Subtotal	**565**	**117,033,886**
	Total	**615**	**117,112,113**

Source: FUNAI (2018).

Visit:
http://snif.florestal.gov.br/pt-br/conservacao-das-florestass

Meeting of Cultures 2018 - Chapada dos Veadeiros - State of Goiás

Legal Reserve

A Legal Reserve was established by the Law 12,651, of May 25th, 2012, as an area where land owners or legal holders must conserve the native vegetation, where only the sustainable use of its resources is allowed.

This Law determines the maintenance of the minimum area below as Legal Reserve:

- **80%**, in rural property located in forest areas within the Legal Amazon;
- **20%**, in rural property located in grassland areas within the Legal Amazon;
- **35%**, in rural property located in cerrado areas within the Legal Amazon;
- **20%**, in rural property located in forest areas or other types of native vegetation located in other regions of the country.

Table 20 - **Remnant Areas, Permanent Protection Areas and Legal Reserves (million/ha) in 2018**

Region	Registry declared area (ha)	Remnant native vegetation area (ha)	Permanent Preservation Area PPA (ha)	Legal Reserve Areas
Midwest	134,759,811	52,306,132	6,103,702	36,159,235
Northeast	79,070,520	28,280,171	2,319,264	16,578,947
North	175,089,920	99,588,497	4,470,641	45,414,920
Southeast	69,630,822	16,241,662	5,070,423	11,070,199
South	45,282,956	8,613,773	3,354,943	5,760,680
Total	**503,834,029**	**205,030,235**	**21,318,973**	**114,983,981**

Source: SiCAR/SFB (2018).

Visit:
http://snif.florestal.gov.br/pt-br/conservacao-das-florestass

Permanent Protection Areas

Permanent Preservation Areas (PPA) are lands protected by Law No. 12,651, of May 25th 2012, which can be covered or not by native vegetation, having the environmental role of preserving water resources, landscape, geological stability, biodiversity, genetic flow of fauna and flora, protecting the soil and ensuring the well-being of human populations. The Permanent Preservation Areas are located:

I - along rivers or any natural intermittent and perennial water stream, except the ephemeral, from its highest level on marginal buffers whose minimum width is:

- 30 m for water streams less than 10 m wide;
- 50 m for water streams from 10 to 50 m wide;
- 100 m for water streams from 50 to 200 m wide;
- 200 m for water streams from 200 to 600 m wide;
- 500 m for water streams wider than 600 m;

Dense humid Forest - Pará

II - Around natural lakes and lagoons (50 m for water bodies up to 20 hectares, 100 m for those larger than 20 hectares in rural areas and 30 m for water bodies in urban areas);
III - Around artificial water reservoirs, resulting from damming or empoundment of natural water streams, in the area defined in the environmental license of the enterprise;
IV - Around springs and perennial water sources, within a radius of 50 meters;
V - On slopes or part of them with declivity greater than 45º, equivalent to 100% at their highest points;
VI - On coastal pioneer vegetation such as dune or mangrove stabilizers;
VII - On mangroves, in all their extension;
VIII - On mesa or plateau edges from the rupture line, in horizontal projections never inferior to 100 meter bands;
IX - On hilltops, hills, mountains, and mountain ranges, with minimum height of 100 m and slope greater than 25°;
X - On areas situated at altitudes over 1,800m;
XI - On veredas, the marginal strip with a minimum width of 50m.

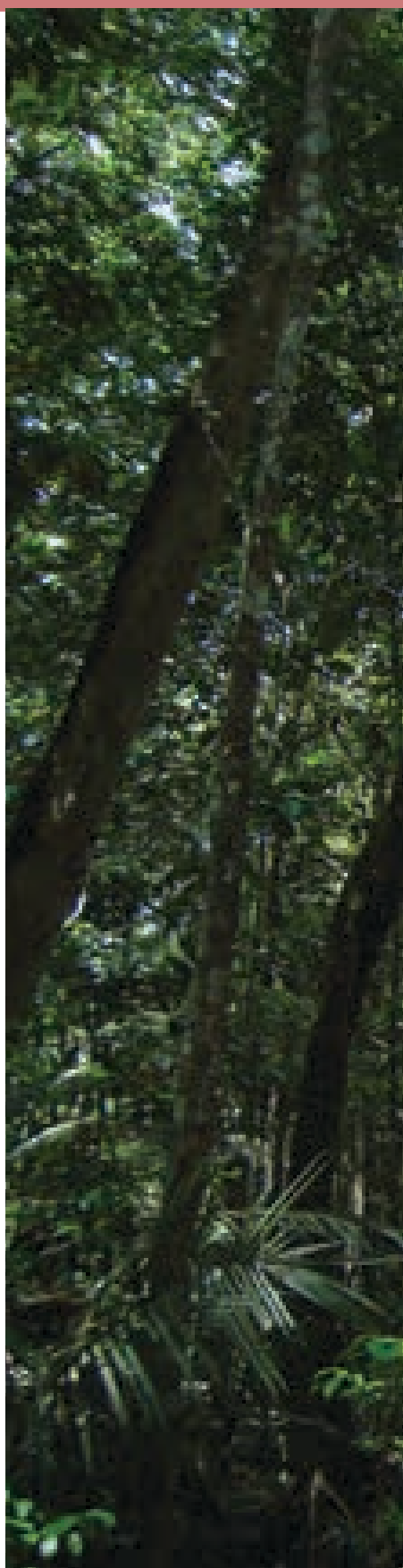
Visit:
http://snif.florestal.gov.br/pt-br/conservacao-das-florestass

Sustainable Forest Management of Natural Forests

Sustainable Forest Management (SFM) is the management of forests in order to obtain economical, social and environmental benefits, while respecting the mechanisms that sustain the ecosystem that is being managed, considering the use of multiple products and by-products, as well as other forest-based goods and services (3rd Article, Law 11,284/2006).

The Sustainable Forest Management Plan (SFMP) is the technical document that establish the guidelines for forestry operations. (Decree 5,975/2006).

Exploring primary forests and secondary formations under a sustainable forest management regime, either within public or private domain, will depend upon the approval of the SFMP by the competent environmental agency (Article 31, Law 12,651/2012).



Logging trail - State of Pará

Sustainable Forest Management in the Amazon

In the last 30 years, Brazil has developed a forest management system for timber production in the Amazon forests that combines use and conservation of forest resources. It consists in an adequate regulatory framework that requires the fulfillment of a set of technical standards in all stages of the the forestry operations, which includes Sustainable Forest Management Plans, Annual Operational Plans, monitoring and controlling of the timber production and on-site technical inspections.

The forest management system used in the Amazon is polycyclic, based on a 35-year cutting cycle with a maximum cutting intensity of 30

Secondary forestry road

m^3 ha^{-1}, and a tree selection based on technical and environmental criteria to promote natural regeneration of the managed forest species. In practice, only 4-6 trees per hectare are felled, through techniques of reduced-impact logging, in order to protect the soil and the quality of the remaining forest.

Some states seek to disclose their activities and programs as a way of making them available to society. In the Amazon region, the state of Pará stands out through the Transparency Portal of the Environment and Sustainability Department. According to this Portal, from August 2016 to July 2017, 3,805,056 hectares were authorized for SFMP, with a volume of 2,732,296 m^3 approved in the state of Pará (SEMAS / PA, 2018).

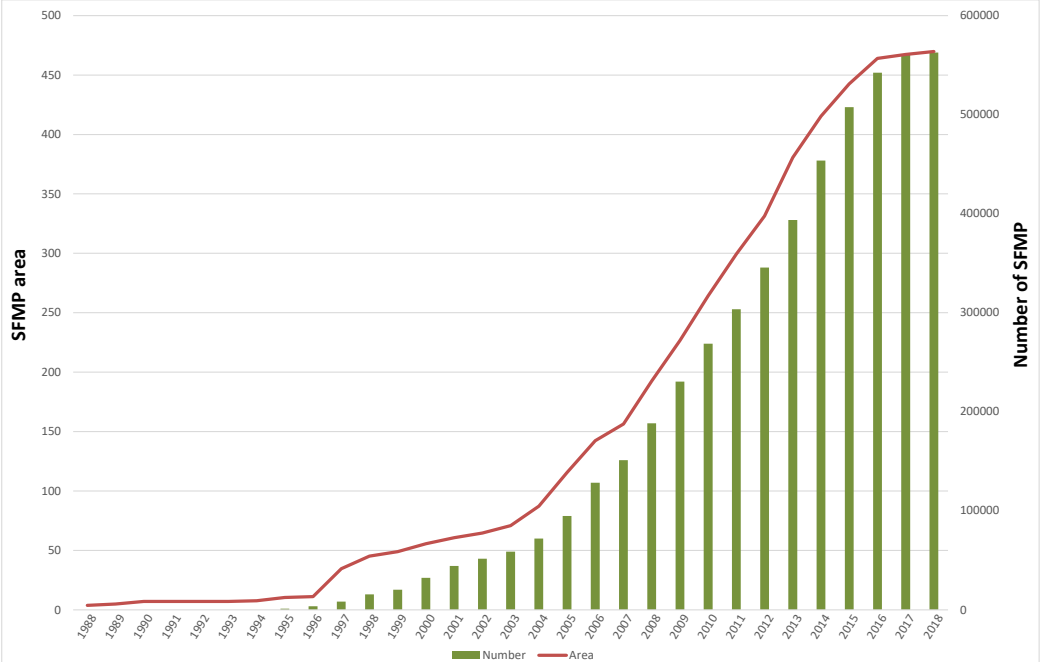
Sustainable Forest Management in the Caatinga

Forest management in the Caatinga is extremely important, especially in order to meet the major demand for firewood and charcoal in the region, . The system is based on the application of simple annual coppice stands, with a rotation period of at least 15 years, it consists in cutting trees near the base, to allow strain regeneration by regrowth.

In 2018, there were 469 active Sustainable Forest Management plans were registered at Caatinga. Considering only the plans active in 2018, those plans accounts 563,000 hectares of managed area, being of these 556,000 hectares approved between 1996 and 2017. A significant increase in total accumulated area from approved management plans started in 2006, which shows a tendency to consolidate the use of sustainable forest management as an alternative for the sustainable use of the Caatinga.

Considering that the biome has a surface of approximately 84.4 million ha, with the forest area reaching 36,3 million ha (43%), only 1,59% of the native vegetation cover is under the sustainable forest management regime.

Graphic 16 - **Total area and number of approved Sustainable Forest Management Plans (PMFS) in the northeast region**



Source: Projeto Nexus I - CNPq/PNE (2019)

Graphic 17 - **Distribution of active Sustainable Forest Management Plans, per state, in the northeast region**

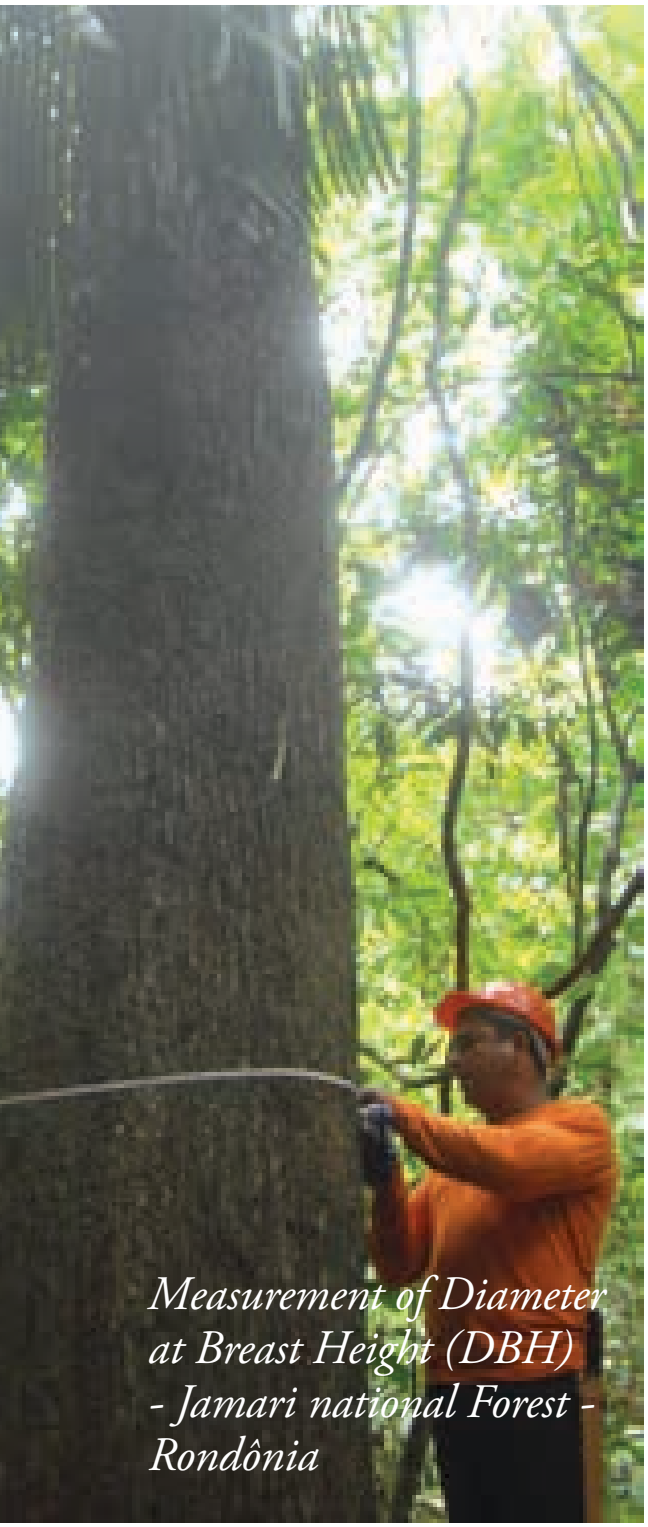
Source: Projeto Nexus I - CNPq/PNE (2019)

Sustainable Forest Management in Public Forests (Forest Concessions)

Forest concession is one of the modalities of public forest management stipulated by Law 11,284, of March 2nd, 2006. It allows the Union, states and municipalities to grant, through bidding, the legal right for a private entity to manage public forests in order to obtain products and services

The concession of public forests can only be accomplished in areas not designated for community, indigenous, settlement projects or military use. Nor can be subject to concession full protected areas, extractive reserves and sustainable development reserves.

The forest under concession remains standing, since the contracts signed only allow the obtaining of forest resources through reduced-impact logging techniques. Therefore, the area is used in a rotation system, which allows the continuous and sustainable production



Measurement of Diameter at Breast Height (DBH) - Jamari national Forest - Rondônia

of timber. Only four to six trees are removed per hectare and the same area will be explored every 30 years, allowing the growth of the remaining trees.

The first federal forest concession contract was signed in 2008 in the Jamari National Forest. Currently, there are 17 concession contracts in operation at the federal level, distributed in six National Forests and in the states of Pará and Rondônia, totaling more than 1 million hectares of public forests in a sustainable production regime, which represents 0.3% of the forest area in this biome.

In December 2018, the federal public forests with contracts signed were: National Forests of Jamari (State of Rondônia), Jacundá (State of Rondônia), Altamira (State of Pará),

Crepori (State of Pará), Saracá-Taquera (State of Pará) and Caxiuanã (State of Pará). The total area granted is 1,018,823 hectares, distributed among 17 concession contracts.

The Amazon region states also hold large areas of public forests and are structuring state programs for public forests concessions. The State of Pará has already 8 concession contracts totaling approximately 433 thousand hectares. The State of Amapá has an area of 67,500 hectares under forest concession (SFB / CNFP, 2018).

Jamari National Forest - State of Rondônia

Table 21 - **Federal forest concessions**

Place	State	Contract	Concession-holder	Contract signature	Area (ha)
Altamira National Forest	Pará	Altamira - UMF I	RRX – Mineração e Serviços Ltda – EPP - UMF I	apr/2015	39,073.00
		Altamira - UMF II	RRX – Mineração e Serviços Ltda – EPP - UMF II	apr/2015	112,994.00
		Altamira - UMF III	Patauá Florestal Ltda - SPE - UMF III	apr/2015	98,414.00
		Altamira - UMF IV	Patauá Florestal Ltda - SPE - UMF IV	apr/2015	111,436.00
Caxiuanã National Forest	Pará	Caxiuanã - UMF I	Benevides Madeiras Ltda. - EPP - UMF I	nov/2016	37,365.15
		Caxiuanã - UMF II	Benevides Madeiras Ltda. - EPP - UMF II	nov/2016	87,067.18
		Caxiuanã - UMF IIII	Cemal Comércio Eco-lógico de Madeiras Ltda. - EPP - UMF III	nov/2016	52,168.08
Jacundá National Forest	Rondônia	Jacundá - UMF I	Madeflona Industrial Madeireira Ltda - UMF I	jun/2013	55,014.27
		Jacundá - UMF II	Madeflona Industrial Madeireira Ltda - UMF II	jun/2013	32,757.96

Place	State	Contract	Concession-holder	Contract signature	Area (ha)
Jamari National Forest	Rondônia	Jamari - UMF I	Madeflona Industrial Madeireira Ltda - UMF I	out/2008	17,176.37
		Jamari - UMF III	Amata S/A - UMF III	set/2008	46,184.25
Saracá-Taquera National Forest	Pará	Saracá--Taquera - UMF II	Ebata Produtos Florestais - UMF II	ago/2010	29,769.82
		Saracá--Taquera - UMF III	Golf Indústria e Comércio de Madeiras - UMF III	ago/2010	18,933.62
de Saracá-Taquera - Lote Sul National Forest	Pará	Saracá-Taquera – Lote Sul - UMF IA	Ebata Produtos Florestais Ltda - UMF IA	mar/2014	26,898.00
		Saracá-Taquera – Lote Sul - UMF IB	Samise Indústria, Comércio e Exploração Ltda - UMF IB	mar/2014	59,408.00
Crepori National Forest	Pará	Crepori - UMF II	Brasad'Oc Timber Comércio de Madeiras - UMF II	jun/2014	134,148.31
		Crepori - UMF III	Brasad'Oc Timber Comércio de Madeiras Ltd - UMF III	jun/2014	59,863.90
Total					**1,018,671.90**

Source: SFB (2017).

Table 22 - **State forest concessions**

Place	State	Contract	Concession-holder	Contract signature	Area (ha)
Amapa State Forest	Amapá	UMF II	Transwood Transportes Ltda - UMF II	2016	67,498
Paru State Forest	Pará	UMF I	CEMAL - Com. Ecol de Madeiras - UMF I	2014	99,725
		UMF II	Madeireira Segredo - UMF II	2014	90,005
		UMF III	RRX Mineração e Serviços Ltda - UMF III	2014	42,190
		UMF VII	RRX Mineração e Serviços Ltda - UMF VII	2016	24,934
		UMF IX	RRX Mineração e Serviços Ltda - UMF IX	2014	24,272
Mamur-Arapiuns Lands	Pará	UMF I	LN Guerra Industria e Comercio de Madeiras Ltda - UMF I	2014	45,812
		UMF II	Rondobel Indústria e Comercio de Madeiras Ltda - UMF II	2014	19,852
		UMF III	Amazonia Florestal Ltda - UMF III	2014	85,767
Total					**500,055**

Source: SFB/CNFP (2017).

Table 23 - **Timber production in federal forest concessions**

Production m³ / year	National Forest					
	Jacundá	Jamari	Saracá-Taquera	Altamira	Caxiuanã	Grand Total
2010		1,911				**1,911**
2011		35,843				**35,843**
2012		34,574	496			**35,070**
2013		30,499	32,737			**63,237**
2014	19,946	29,782	37,729			**87,456**
2015	37,850	31,047	57,214			**126,110**
2016	34,086	31,792	88,279	12,959		**167,117**
2017	26,823	28,738	72,569	46,014		**174,143**
2018	34,730	33,598	72,183	65,694	15,452	**221,657**
Grand Total						**912,544**

Source: SFB/SCC (2019).

Visit:
http://snif.florestal.gov.br/pt-br/concessao-florestal

Log yard - State of Rondônia

Community Forest Management

Community forests are forests designated for the use of traditional people and communities, indigenous people, family farmers, and settlers registered in the agrarian reform national program. The Brazilian Constitution safeguards the right of indigenous peoples to their ancestral territories, and the Public Forest Management Law (No. 11,284, of March 2nd, 2006) reinforces the right of local communities to the usufruct, without charge, of forest resources. In 2009, a presidential decree was issued that establishes the Federal Program of Community and Family Forest Management - PMCF (Decree 6,874 / 2009), created to coordinate the actions of management and promotion of sustainable forest management aimed at traditional communities and farmers that use the Brazilian forests for their subsistence.

The efforts of the Brazilian government to recognize these rights are evident in the area of public forests designated for community use, which is currently about 46% of the registered public forests. For the promotion of community and family forest management, the National Forest Development Fund (FNDF) supports several projects through the provision of technical assistance. Between 2010 and 2017, 25,959 hectares were under community forest management in the Caatinga (SFB / PAAR, 2018), approximately 0.7% of the total area sustainably sustained in the Caatinga.

Table 24 - **Federal community forests**

Public forests with community use	Area (ha)
Extractive Reserve (RESEX)	13,908,288
Sustainable Development Reserve (RDS)	11,002,866
Indigenous Land	117,099,985
Forest Settlement Project (PAF), Agroextractive Settlement Program (PAE) e Sustainable Development Program (PDS)	15,365,667
Total	**157,376,806**

Source: SFB/CNFP (2019).

Comunity forest management - State of Pará

Log yard at a timber processing industry - State of Rondônia

FOREST PRODUCTION, ECONOMY AND MARKET

Employments

The number of formal jobs in Brazil is accounted for by the Department of Labor, a body linked to the Ministry of Economy, based on the number of active formal labor until December 31, 2018.

In the forest sector the job segments are the following:

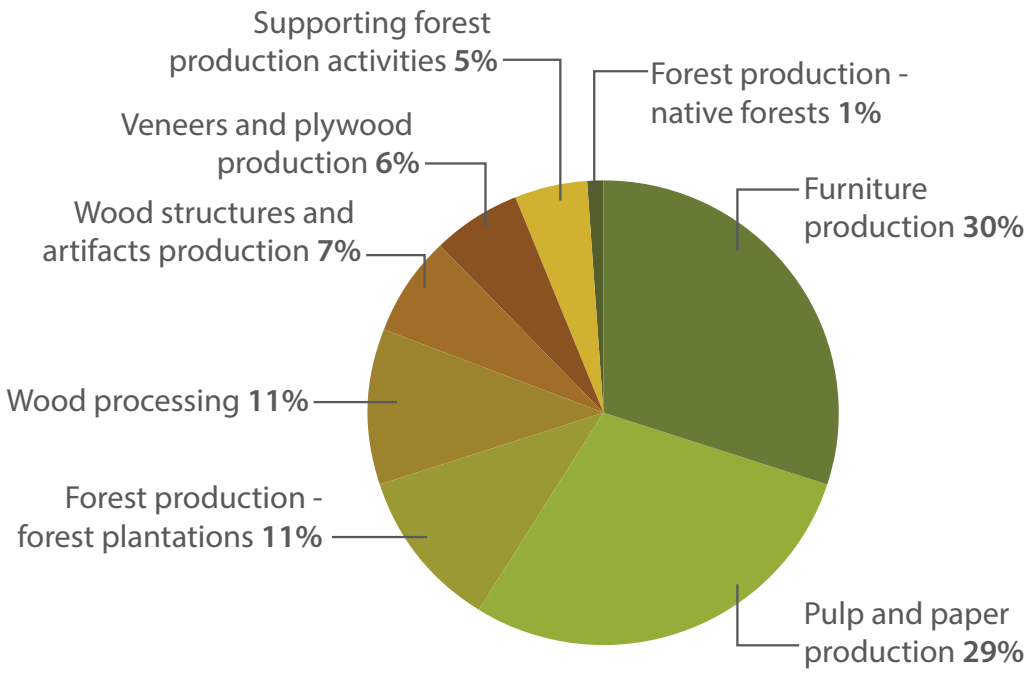
- **Forest production support activities**: includes logging, felling, transportation, wood evaluation, dendrometry, unloading wood and services related to silviculture and vegetal extraction.
- **Wood processing**: includes production of sawnwood, sleepers, boards, ceiling, blocks, poles, etc.
- **Forest production - native forests:** includes the following activities: extraction, logging, harvesting, charcoal production and processing.
- **Forest production - forest plantations:** includes the following activities: planting, logging, plant seedling production, bark, leaf and resin extraction.
- **Furniture production:** includes furniture manufacture using mostly wood.

Table 25 - **Number of employments per forest sector segment**

Forest sector segment	2012	2013	2014	2015	2016	2017	2018
Supporting forest production activities	47,289	39,909	38,530	33,049	31,516	31.834	33,759
Wood processing	81,267	78,078	75,734	70,654	65,945	54.139	51,882
Pulp and paper production	177,230	181,634	184,767	177,323	171,536	82.734	78,478
Wood structures and artifacts production	48,688	48,402	47,540	44,013	40,803	43.565	45,776
Veneers and plywood production	40,644	40,888	40,563	37,869	36,130	27.711	24,909
Forest production - native forests	8,380	7,380	8,295	7,668	6,554	11.540	11,638
Forest prodution - forest plantations	66,734	64,543	62,519	63,058	63,777	53.231	52,270
Furniture production	204,743	207,208	208,481	191,929	176,395	121.889	122,278
Total	**674,975**	**668,042**	**666,429**	**625,563**	**592,656**	**428.660**	**423,008**

Source: Brasil - Secretaria do Trabalho/ME - RAIS (2019)

Graphic 18 - **Proportion of formal jobs per forest segment in 2018**



Source: Secretaria do Trabalho/ME - RAIS (2019).

Visit:
http://snif.florestal.gov.br/pt-br/emprego

Amata forest concessionaire sawmill. - Itapuã do Oeste - State of Rondônia

Forest Extraction and Production

Wood Products

Table 26 - **Quantity of roundwood from native and plantation forests and their main uses**

Rounwood		Quantity (1,000 m³)	
Source	**Use**	**2010**	**2011**
Native forest	Fuel	50,230	48,384
	Industry	12,655	14,117
Subtotal for native forests		**62,885**	**62,501**
Forest plantation	Fuel	75,689	84,764
	Industry	115,742	125,853
Subtotal for forest plantations		**191,431**	**210,617**
Total		**254,316**	**273,118**

Source: IBBE/PEVS (2017) adapted SFB

Table 27 - **Value of roundwood from native and plantation forests and their main uses**

Rounwood		Value (million R$)	
Source	**Use**	**2010**	**2011**
Native forest	Fuel	1,275	1,321
	Industry	2,156	2,709
Subtotal for native forest		**3,431**	**4,030**
Forest plantation	Fuel	3,315	4,135
	Industry	7,246	8,862
Subtotal for forest plantations		**10,561**	**12,997**
Total		**13,992**	**17,027**

Source: IBGE/PEVS (2017) adaptado SFB.

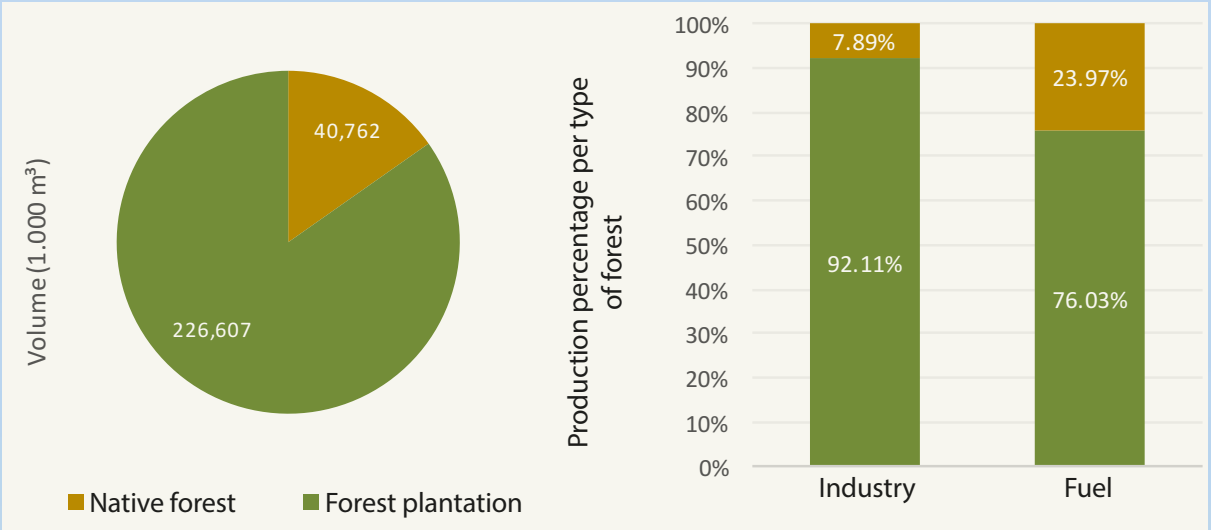
Note: Quantity and value for fuel resulted from the amount of fuelwood and charcoal (converted into fuelwood) produced in the period. Wood for industrial use: wood used for pulp production, sawnwood, veneers, laminates and other uses.

Lumber yard - Rondônia

Quantity (1,000 m³)					
2012	**2013**	**2014**	**2015**	**2016**	**2017**
43,591	39,005	37,076	33,336	29,311	24,931
14,926	13,519	13,807	12,309	11,451	12,232
58,517	**52,524**	**50,883**	**45,645**	**40,762**	**37,163**
97,544	100,058	105,922	97,617	92,959	98,865
131,879	129,641	132,724	123,868	133,651	139,826
229,423	**229,699**	**238,646**	**221,485**	**226,610**	**238,691**
287,940	**282,223**	**289,529**	**267,130**	**267,372**	**275,854**

Value (million R$)					
2012	**2013**	**2014**	**2015**	**2016**	**2017**
1,259	1,223	1,235	1,134	1,020	858
2,007	1,904	2,017	2,068	1,839	1,925
3,266	**3,127**	**3,252**	**3,202**	**2,859**	**2,783**
4,640	4,950	5,666	4,773	4,710	4,854
9,413	9,059	10,256	8,570	9,037	9,586
14,053	**14,009**	**15,922**	**13,343**	**13,747**	**14,440**
17,319	**17,136**	**19,174**	**16,545**	**16,606**	**17,223**

Graphic 19 - **Participation of native and plantation forests in the production of roundwood for industry and fuel in 2017**



Source: IBGE/PEVS (2018).

Lumber yard - Rondônia

Table 28 - **Annual production of sawnwood and pannels (1,000 m³)**

Product	2012	2013	2014	2015	2016	2017
Sawnwood	5,260	4,876	5,609	8,546	5,305	6,283
Plywood	2,500	2,376	2,604	2,473	4,222	3,867
Laminates	659	813	939	1,356	999	917
Fiberboards	5,566	5,960	8,854	8,187	8,246	7,858
Particleboards	3,199	3,900	3,175	3,540	2,900	3,150
Total	**17,184**	**17,925**	**21,181**	**24,102**	**21,672**	**22,075**

Source: IBGE/PIA (2018).
Note: Sanwood includes sleepers, planks, boards and laths.

Table 29 - **Annual production of wood pulp and paper (1,000 tons)**

Product	2012	2013	2014	2015	2016	2017
Wood pulp	11,361	11,091	11,900	12,857	24,271	27,123
Paper and cardboard	11,828	11,731	12,136	12,241	27,794	25,341
Recycled paper	71	53	55	44	23	47
Total	**23,189**	**22,822**	**24,036**	**25,098**	**52,088**	**52,511**

Source: IBGE/PIA (2018).

Non-Timber Forest Products

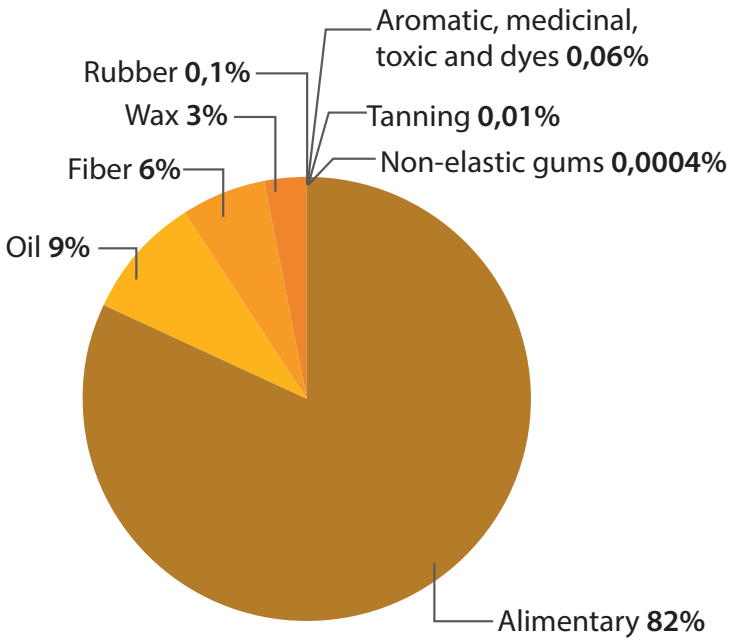
Tabela 30 - **Non-timber products extracted from natural forests (tons)**

Product	2011	2012	2013	2014	2015	2016	2017
Alimentary	514,355	519,599	574,808	614,332	642,579	640,060	648,902
Aromatic, medicinal, toxic and dyes	729	551	458	459	464	468	358
Rubber	3,005	2,337	1,958	1,539	1,499	1,206	1,042
Wax	21,274	20,330	20,363	20,662	22,034	19,631	20,567
Fiber	65,903	61,841	49,080	48,473	46,840	47,550	12,305
Non-elastic gums	1	1	0	1	3	3	1
Oil	115,099	104,182	96,148	90,441	85,680	68,256	58,238
Tanning	178	170	148	138	119	112	39
Total	**720,544**	**709,011**	**742,963**	**776,045**	**799,218**	**777,286**	**741,452**

Source: IBGE/PEVS (2018).

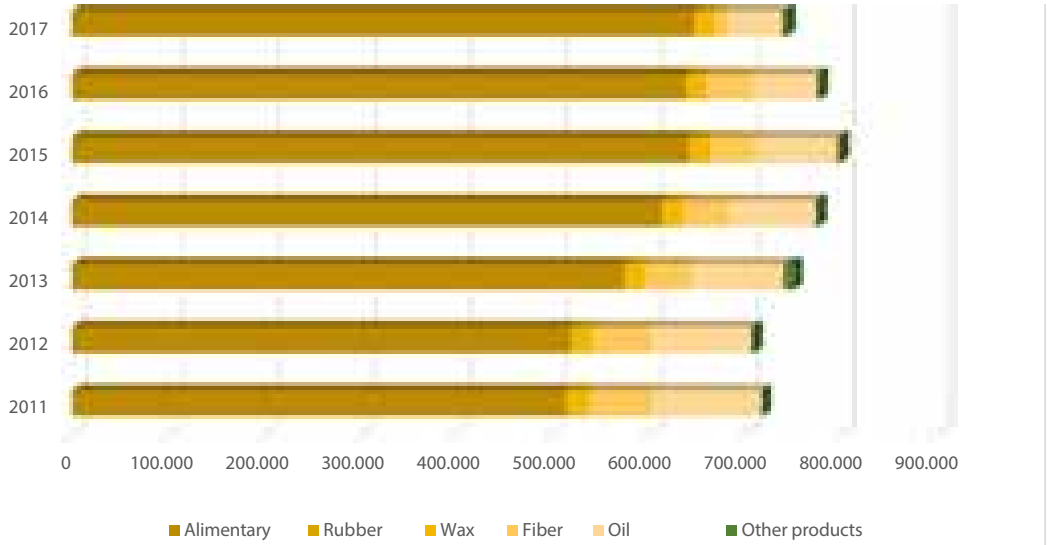
Nuts of Baru - Cerrado - State of Goiás

Graphic 20 - **Percentage produced per product type in 2017**



Source: IBGE/PEVS (2018).

Graphic 21 - **Historical series of the quantity produced, per type of product extracted from natural forest**



Source: IBGE/PEVS (2018).

Table 31 - **Quantity of main non-timber forest products extracted from native species**

Product	Quantity extracted (tons)						
	2011	2012	2013	2014	2015	2016	2017
Açai berry	215,380	199,116	202,216	198,149	216,071	215,609	219,885
Cashew--nut	3,179	3,054	2,931	2,489	2,160	1,745	1,715
Brazilian nut	42,152	38,805	38,300	37,499	40,643	34,664	26,191
Mate	229,681	252,700	300,128	333,017	341,251	346,953	354,398
Mangaba	680	677	639	685	663	922	1,022
Palm heart	5,563	4,787	4,620	4,729	4,669	4,260	4,350
Pequi	-	-	-	19.241	18.866	17.305	21,433
Pine nut	8,032	9,638	8,293	8,777	8,393	7,746	9,293
Umbu (berry)	9,323	7,980	7,561	7,466	7,451	8,390	7,465
Rubber	3,005	2,337	1,958	1,539	1,499	1,206	1,032
Carnaúba wax	21,274	20,330	20,363	20,662	22,034	19,631	19,409
Buriti fiber	465	469	466	466	451	441	491
Piaçava fiber	61,409	57,762	44,617	45,758	44,805	45,645	9,766
Carnaúba fiber	1,640	1,667	2,317	1,878	1,298	1,125	1,431

Product	Quantity extracted (tons)						
	2011	2012	2013	2014	2015	2016	2017
Babassu almond	106,055	102,499	97,820	89,739	83,917	77,955	54,330
Copaíba oil	580	214	127	153	164	153	171
Licuri (coconut)	4,307	4,213	3,925	3,760	3,744	4,072	1,092
Pequi almond	5,786	7,047	939	1,544	1,381	2,228	478

Source: IBGE/PEVS (2018).

Açaí berries - Pará

Table 32 - **Value of main non-timber forest products extracted from native species**

Product	Value (1,000 R$)						
	2011	2012	2013	2014	2015	2016	2017
Açai berry	304,566	336,234	409,698	422,064	480,450	539,836	596,768
Cashew--nut	3,820	4,033	4,057	4,386	4,670	4,818	5,479
Brazilian nut	69,404	68,437	72,055	79,565	107,443	110,091	104,147
Mate	118,049	155,294	322,216	403,121	399,589	398,763	423,907
Mangaba	1,006	1,447	1,414	1,581	1,575	2,066	2,732
Palm heart	9,535	10,861	11,214	12,716	14,406	16,026	14,625
Pequi	-	-	-	14,589	14,236	14,034	20,650
Pine nut	10,955	14,419	14,935	19,325	21,187	22,405	22,956
Umbu (berry)	7,600	7,640	8,078	8,685	9,832	11,162	7,760
Rubber	8,202	6,677	7,682	5,777	5,245	4,174	3,918
Carnaúba wax	108,268	113,596	139,196	172,327	225,625	211,471	13,331
Buriti fiber	2,054	1,992	2,013	2,253	2,226	2,249	2,546
Piaçava fiber	123,435	108,984	82,936	94,302	95,843	103,711	15,496
Carnaúba fiber	1,387	1,731	3,053	2,996	2,517	2,411	3,199
Babassu almond	142.208	127.609	121.854	123.153	107.746	95.508	95,814

Product	Value (1,000 R$)						
	2011	2012	2013	2014	2015	2016	2017
Copaíba oil	2,178	1,725	2,514	3,420	3,432	3,789	3,801
Licuri (coconut)	4,105	4,017	4,747	3,974	4,039	3,741	1,359
Pequi almond	11,113	2,446	4,205	4,090	4,897	4,042	3,357

Source: IBGE/PEVS (2018).

Fruit from the Cerrado biome - State of Goiás

Table 33 - **Quantity of main non-timber forest products extracted from forest plantations**

Product	Quantity produced (t)						
	2011	2012	2013	2014	2015	2016	2017
Black Wattle bark	105,578	103,006	72,802	69,991	62,946	195,913	136,718
Eucalyptus leaf	56,797	46,474	56,743	24,600	36,462	38,285	81,487
Resin	71,619	73,776	71,853	72,007	95,831	106,227	121,080
Total	233,994	223,256	201,398	166,598	195,239	340,425	339,285

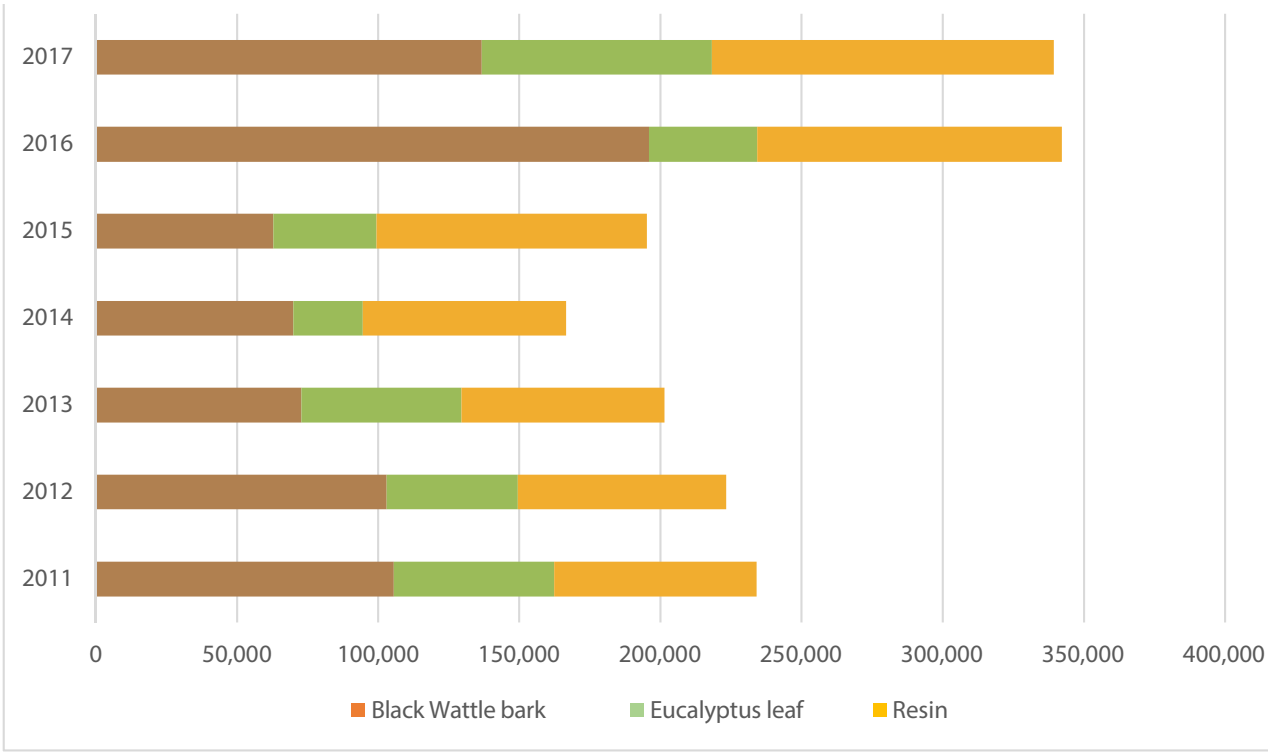
Fonte: IBGE/PEVS (2018).

Table 34 - **Value of main non-timber forest products from forest plantations**

Product	Production value (R$1,000)						
	2011	2012	2013	2014	2015	2016	2017
Black Wattle bark	11,799	13,071	10,724	11,148	11,869	42,615	30,071
Eucalyptus leaf	2,544	2,310	2,830	1,491	2,145	2,296	4,915
Resin	137,528	117,688	127,375	203,424	278,867	282,130	325,134
Total	151,871	133,069	140,929	216,063	292,881	327,041	360,120

Source: IBGE/PEVS (2018).

Graphic 22 - **Quantity of non-timber forest products extracted from forest plantations**



Source: IBGE/PEVS (2018).

Forest Extraction, visit:
http://snif.florestal.gov.br/pt-br/extracao

Forest Production, visit:
http://snif.florestal.gov.br/pt-br/producao

Exports of Forest Products

Table 35 - **Exports of main forest products**

Forest Product	Unit of measurement	2010	2011
Charcoal	ton	2,806	927
Wood chips and particles	m^3	4,743,656	4,249,014
Roundwood	m^3	23,709	74,979
Sawnwood	m^3	1,358,811	1,325,140
Other pulps	ton	5,901	3,743
Particleboard	m^3	76,248	85,523
Plywood	m^3	1,443,764	1,216,032
Veneer sheets	m^3	42,411	69,225
Fiberboard	m^3	153,424	167,191
Paper and paperboard	ton	1,968,683	1,941,623
Recycled paper	ton	4,524	26,930
Wood pallets	ton		
Wood pulp (cellulose)	ton	8,792,623	8,879,772
Wood residues	m^3	1,462	855

Source: MDIC (2018).

Transport of tropical roundwoods - State of Rondônia

2012	2013	2014	2015	2016	2017
882	1,211	1,287	4,151	5,411	3,844
4,370,967	4,963,514	5,405,773	5,622,721	6,437,485	6,483,357
66,050	139,057	279,974	225,399	332,944	246,294
1,221,782	1,208,055	1,498,854	1,830,035	2,514,904	493,303
10	330	1,211	1,417	580	9
98,327	96,862	116,581	191,343	439,901	603,016
1,345,440	1,457,302	1,582,181	1,867,812	2,267,512	2,687,718
55,386	60,099	78,556	87,442	101,656	144,354
240,166	330,173	410,418	594,088	811,285	919,904
1,763,084	1,748,394	1,723,920	1,920,562	1,938,848	1,947,802
28,634	31,254	27,448	78,159	30,253	53,150
6	194	6,600	24,368	35,768	108,376
8,911,538	9,848,334	11,028,410	11,963,376	13,519,536	13,841,742
1,794	6,409	654	2.581	3,889	2,067

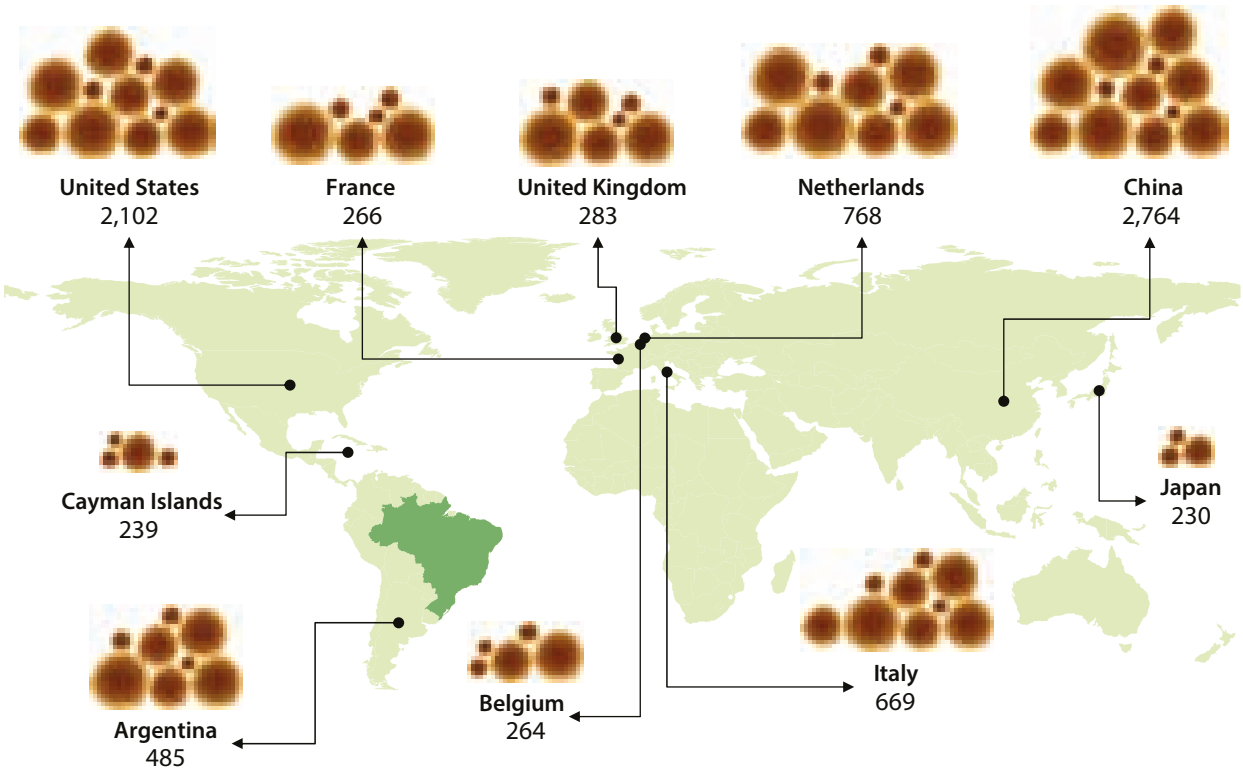
Table 36 - **Value of main forest products exports**

Forest Product	Value (1,000 US$)	
	2010	2011
Charcoal	1,116	560
Wood chips and particles	110,807	107,490
Roundwood	5,045	11,493
Sawnwood	418,128	408,696
Other pulps	9,688	10,156
Particleboard	23,748	26,777
Plywood	418,259	370,360
Veneer sheets	30,290	36,091
Fiberboard	57,966	67,790
Paper and paperboard	1,763,862	1,915,477
Recycled paper	1,459	6,683
Wood pallets	0	0
Wood pulp (cellulose)	4,750.531	4,984,784
Wood residues	29	23

Source: MDIC (2018).

Value (1,000 US$)					
2012	2013	2014	2015	2016	2017
457	692	742	1.650	1,563	1,859
116,865	129,061	132,439	135,827	141,403	144,062
12,656	12,429	24,650	32,512	40,780	39,529
351,757	353,428	425,332	455,628	537,188	201,818
61	533	1,632	1,839	815	42
28,152	29,020	34,667	43,044	81,077	113,957
408,101	429,229	467,760	482,205	478,097	613,998
34,427	30,081	34,852	33,209	26,422	31,368
88,487	117,978	135,863	172,435	196,868	212,418
1,721,527	1,734,432	1,688,399	1,777,534	1,617,880	1,657,793
5,432	6,027	5,658	15,248	5,194	10,114
10	48	1,409	4,361	5,803	17,304
4,700,438	5,179,426	5,290,856	5,586,318	5,569,270	6,345,193
93	239	108	291	420	413

Figure 16 - **Main destinations of the Brazilian forest products exports in 2017 (million US$)**



Source: MDIC (2018).

Visit:
http://snif.florestal.gov.br/pt-br/comercio

Table 37 - **Quantity of main non-timber forest products exports**

	Quantity (tons)							
	2010	2011	2012	2013	2014	2015	2016	2017
Rubber	7,380	7,762	9,226	1,700	1.214	2,322	1,481	2,543
Cashew--nut	42,175	26,302	25,431	20,964	17.023	12,957	15.604	11,424
Brazilian nut	8,998	10,350	11,118	13,619	7.902	21,482	8.498	4,288
Vegetable wax	17,661	15,828	15.289	15,732	16.128	16,019	15.859	15,696
Mate Herb	33,270	35,437	36,272	38,010	34,599	35,956	35,325	33,625
Vegetable oil*	456	545	241	326	409	504	613	670
Palm heart	1,292	952	625	510	384	348	443	265

Source: MDIC (2018).

Table 38 - **Value of main non-timber forest products exports**

	Value (1.000 US$)							
	2010	2011	2012	2013	2014	2015	2016	2017
Rubber	29,554	52,647	48,562	7,871	3,912	6,477	4,208	5,944
Cashew--nut	229,572	226,658	186,390	134,170	110,302	102,725	129,611	114,090
Brazilian nut	13,447	14,175	25,156	21,115	14,737	41,692	15,128	11,961
Vegetable wax	100,400	108,108	119,411	100,847	120,957	117,485	99,224	101,989
Mate Herb	50,958	60,986	68,721	98,708	114,087	101,508	82,355	78,831
Vegetable oil*	4,823	7,769	2,936	3,827	5,597	6,563	7,592	8,360
Palm heart	6,567	5,125	3,350	2,861	2,397	1,890	2,173	1,428

Source: MDIC (2018).

Note: * Includes babassu, cabreúva, cedar, eucalyptus, jojoba, rosewood and pau-santo oils.

Imports of Forest Products

Table 39 - **Imports of main forest products**

Forest Product	Unit of measurement	Value (1.000 US$)	
		2010	2011
Charcoal	ton	124,180	110,460
Wood chips and particles	m^3	11,249	946
Roundwood	m^3	26,004	28,783
Sawnwood	m^3	84,298	58,173
Other pulps	ton	9,637	7,525
Particleboard	m^3	18,381	3,701
Plywood	m^3	3,531	1,754
Veneer sheets	m^3	10,239	8,741
Fiberboard	m^3	191,158	230,389
Paper and paperboard	ton	1,390,041	1,316.301
Recycled paper	ton	20,136	10,949
Wood pallets	ton	-	-
Wood pulp (cellulose)	ton	424,404	410,043
Wood residues	m^3	275,619	244,818

Source: MDIC (2018).

Value (1.000 US$)					
2012	2013	2014	2015	2016	2017
77,354	38,833	41,256	12,613	3,997	6,189
368	377	537	613	796	1,577
25,400	22,399	20,182	20,148	15,837	17,144
44,537	35,892	33,484	28,390	29,998	17,722
10,586	7,973	9,782	9,711	14,277	15,529
4,702	8,448	4,994	554	1,014	1,269
2,228	2,417	2,029	1,446	738	631
8,243	9,636	9,342	5,439	4,716	4,745
129,711	120,531	89,603	14,049	3,485	8,889
1,280,773	1,150,245	1,145,008	775,313	617,451	571,578
8,166	10,005	24,949	5,381	12,698	15,794
305	1,160	454	367	829	873
422,984	443,915	429,074	423,905	374,300	225,698
148,248	127,560	139,776	107,713	84,607	8,833

Table 40 - **Value of main forest products imports**

Forest Product	Value (1.000 US$)	
	2010	2011
Charcoal	11,541	12,177
Wood chips and particles	177	353
Roundwood	1,154	1,338
Sawnwood	14,736	18,818
Other pulps	15,526	17,317
Particleboard	5,289	1,836
Plywood	2,386	1,747
Veneer sheets	9,875	9,095
Fiberboard	49,653	67,951
Paper and paperboard	1,222,509	1,309,311
Recycled paper	3,027	2,598
Wood pallets	-	-
Wood pulp (cellulose)	341,533	354,463
Wood residues	747	840

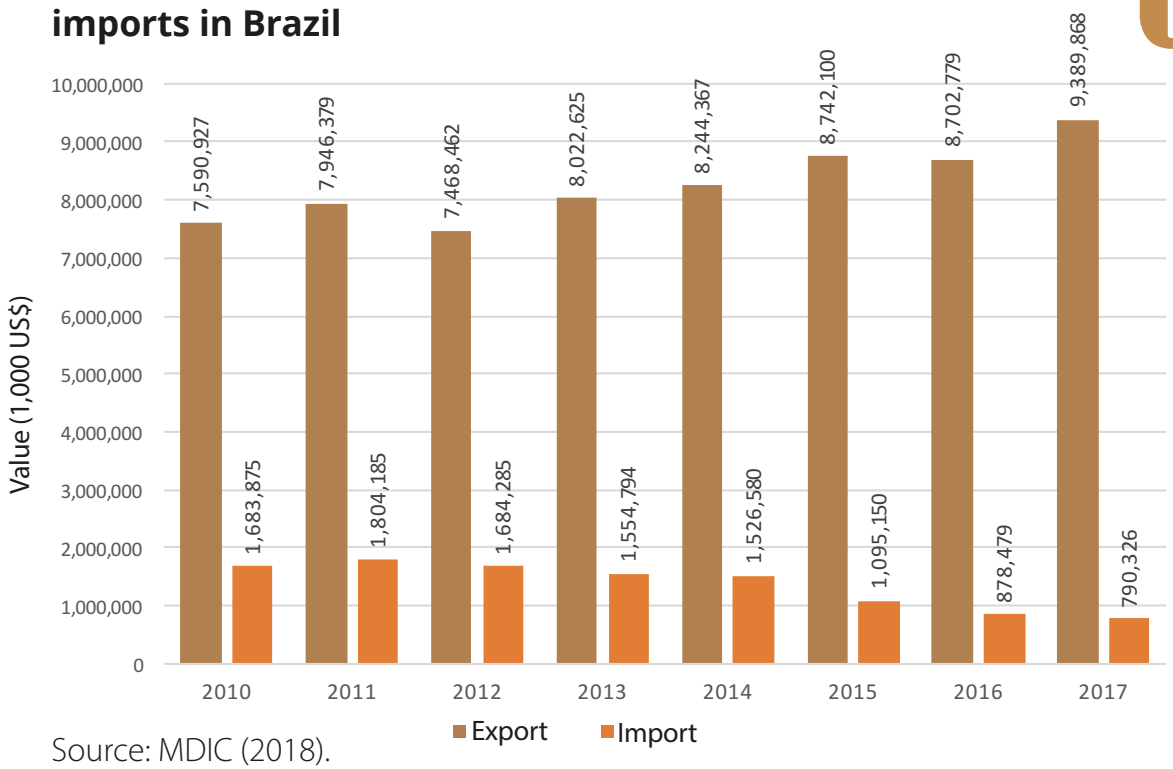
Source: MDIC (2018).

Visit:
http://snif.florestal.gov.br/pt-br/comercio

Log yard - State of Rondônia

Value (1.000 US$)					
2012	2013	2014	2015	2016	2017
8,666	5,227	6,165	3,170	2.872	4,858
385	348	508	385	542	795
1,123	1,037	923	793	537	696
22,620	18,859	26,314	30,185	34,850	24,812
21,324	13,163	14,828	13,562	19,452	24,042
2,707	3,057	1,054	344,728	543,771	600
2,657	3,695	2,727	2,272	1,535	582
8,034	10,761	14,473	9,963	7,256	7,264
41,532	36,973	25,817	6,412	2,081	5,102
1,249,719	1,131,047	1,096,044	697,787	543,367	563,328
1,777	2,003	4,585	1,192	2,452	3,226
19	68	27	24	54	71
316,082	321,507	327,842	323,957	259,896	154,644
722	842	772	770	617	306

Graphic 23 - **Comparison of main forest products exports and imports in Brazil**



Source: MDIC (2018).

Volume of Timber transported in the Legal Amazon

The Document of Forest Origin (DOF), instituted by the MMA Regulatory Ordinance No. 253, in August 18, 2006, is the mandatory license for transportation and storage of native-originated forest products, including charcoal. The document contains all the information about the origin of these products, following instructions from Article 36 of the Law No. 12,651/2012 (Native Vegetation Protection Law).

The DOF system works similar to an accounting tool, registering the flow of credits given in authorizations for forest resource use, like in a checking account system, from the deposit of the initial volume, in the extraction site or in the point of entry in the country, in case of imports, up to the exit point of the chain of custody, when the product is consumed or ceases to be the object of forest control.

The volume in roundwood (logs, short logs, posts, poles, scrap wood) of legally traded timber originated from the Legal Amazon native forests, in 2016, was 2.7 million m^3 (partial data).

Table 41 - **Roundwood extraction in the Legal Amazon in 2016**

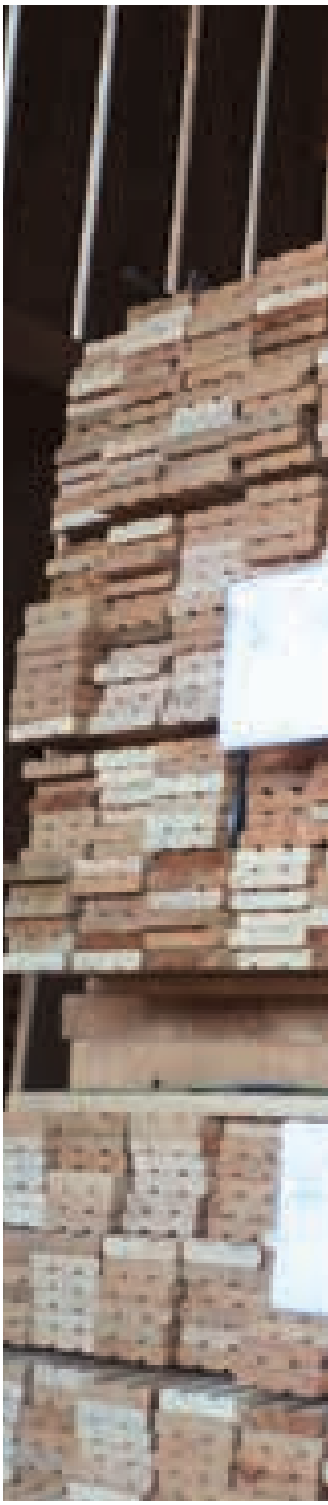
State of origin	Roundwood extraction commercialized (m^3)
Acre	103,502
Amapá	142,858
Amazonas	621,301
Maranhão	21,978
Mato Grosso[1]	-
Pará[1]	149,017
Rondônia	1,268,604
Roraima	351,011
Tocantins	13,404
Legal Amazon	2,671,676

Source: Ibama/DOF (2017).
[1]Incomplete data, do not contemplate the internal movements of the states of Mato Grosso and Pará.

Log and lumber yard - State of Rondônia

The movement of native timber forest products from the Legal Amazon to other states of Brazil totalized 2.97 million m^3 in 2016. This volume includes products that were stored in log decks, products originally registered in the state systems, federal concessions and extractivism. Of this total, 84% represent sawnwood (2.5 million m^3). The most commercialized species are maçaranduba (Manilkara huberi, 261,830 m^3), cupiúba (Goupia glabra, 208,331 m^3) and cedrinho (Erisma uncinatum, 178,169 m^3).

In order to estimate the volume of timber forest products from the Legal Amazon, data from the DOF System are used.



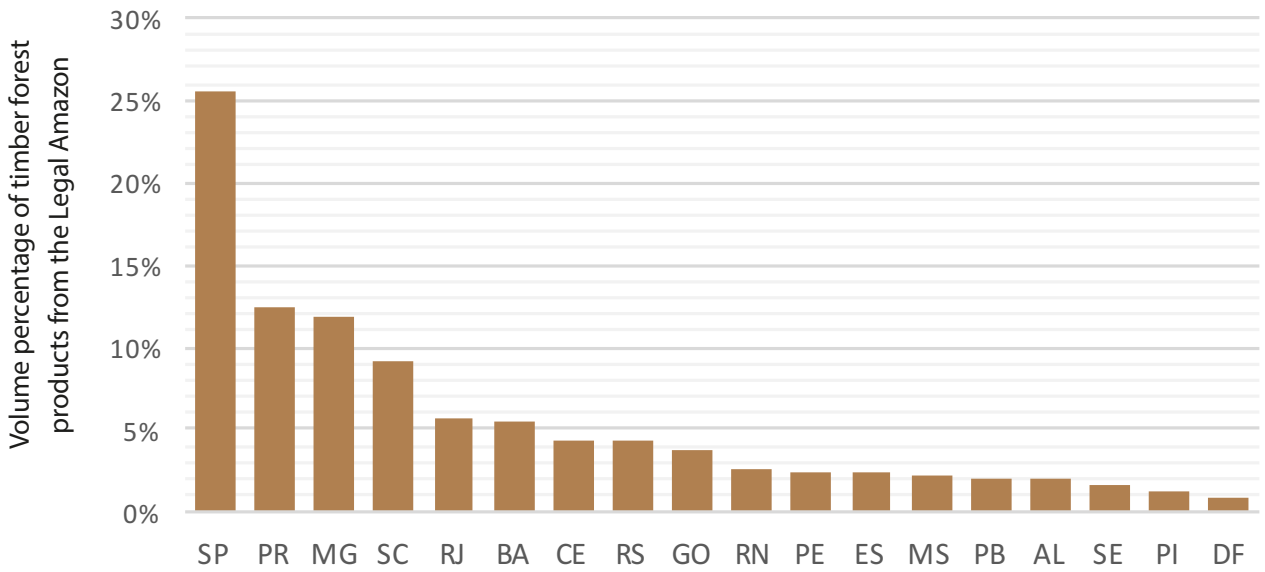
Pile of lumber - State of Rondônia

Table 42 - **Volume of wood products from the Legal Amazon traded in other States**

Brasil	
Federative Unit	**Volume (m^3)**
SP	759,263
PR	370,858
MG	348,946
SC	268,817
RJ	169,120
BA	164,603
CE	130,417
RS	127,185
GO	109,810
RN	76,379
PE	73,147
ES	72,558
MT	65,105
PB	62,491
AL	58,684
SE	46,857
PI	37,059
MG	27,122
Total	2,968,421

Source: Ibama/DOF (2017).

Graphic 24 - **Total volume percentage of wood products from the Legal Amazon traded in other States, in 2016**



Source: Ibama/DOF (2017).

Table 43 - **Type of Wood Products from the Legal Amazon traded in other State in 2016**

Product	Volume (m³)
Wood chips	3,695
Plywood	10,646
Stake	96
Veneer	119,342
Lumber	4
Processed wood	249,188
Roundwood	2,095
Sawnwood	2,497,638
Fence post	1
Wood residues	85,716
Total	**2,968,421**

Ibama/DOF (2017).

Visit:
http://www.florestal.gov.br/snif/gestao-florestal/documento-de-origem-florestal-dof

Forest Certification

The forest and chain of custody certification in Brazil is carried out by several certification companies, through two certification systems: the Brazilian Program for Forest Certification (Cerflor), bound to the Programme for the Endorsement of Forest Certification Schemes (PEFC), and the Forest Stewardship Council (FSC).

The certification of forest management ensures that the forest is managed in a responsible manner in accordance with the principles and criteria of certification for timber and non-timber products.

Chain of custody certification ensures traceability from the production of the raw material to the final consumer. It applies to producers who process the raw material from certified forests.

Tag log - State of Rondônia

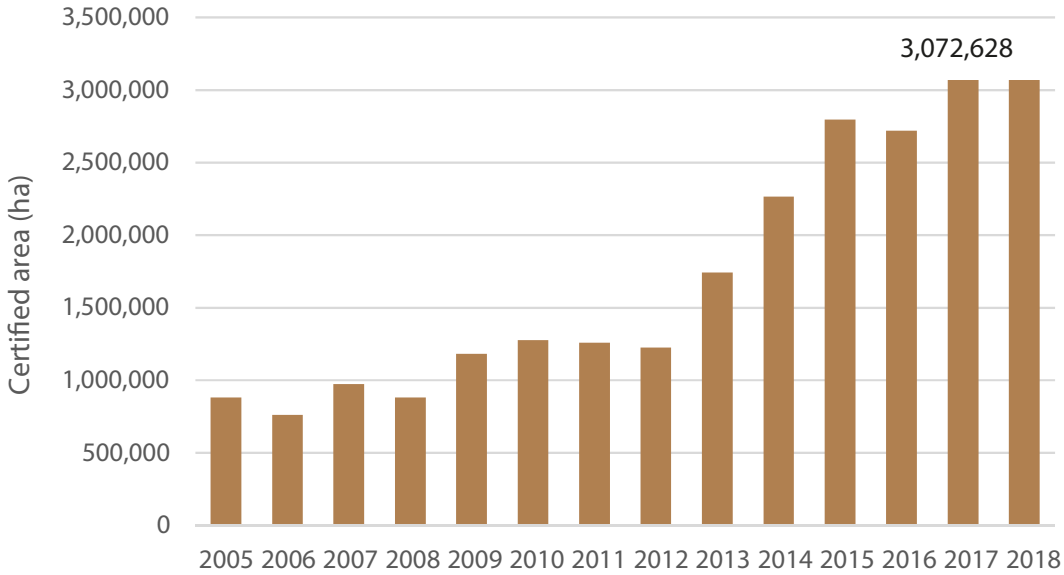
Cerflor – Brazilian Program for Forest Certification

The Programme for the Endorsement of Forest Certification (PEFC) is an international non-profit, non-governmental organization dedicated to promoting Sustainable Forest Management (SFM) through independent third-party certification. It acts by endorsing national forest certification systems adapted to local conditions and priorities. In Brazil, the endorsed system is Cerflor.

Cerflor aims at forest management and chain of custody certification, prescribed in the standards developed by ABNT (Brazilian Technical Standards Association) and integrated into the Brazilian System of Conformity Assessment and the National Institute of Metrology (Inmetro).

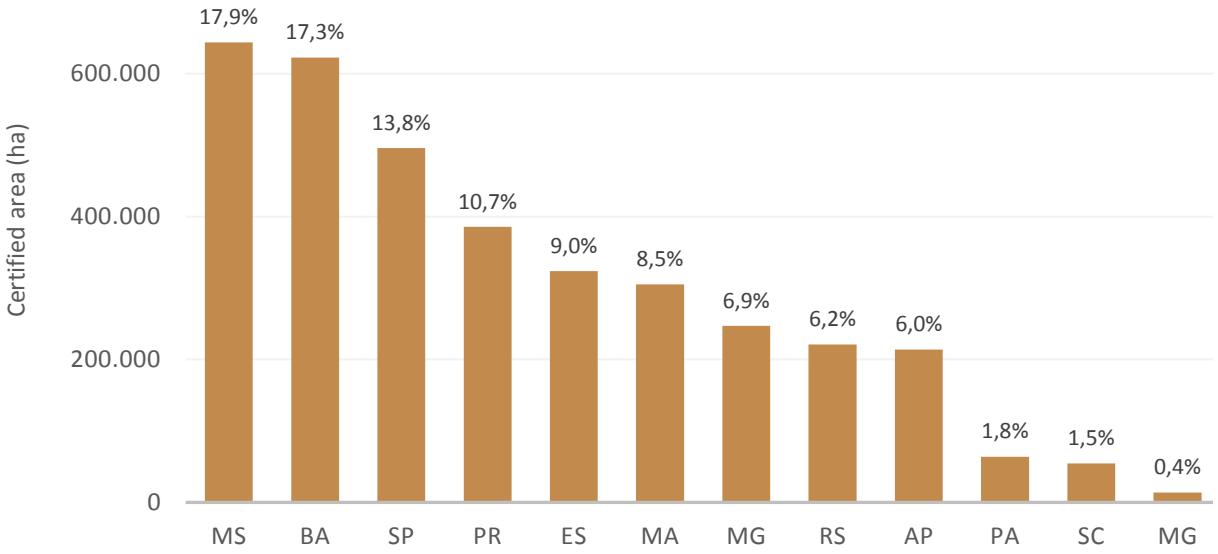
Until May 2018, there were, in Brazil, 56 chain of custody certifications for forest products and 3,072,628 hectares of forest management certified by Cerflor.

Graphic 25 - **Evolution of the PEFC certified area in Brazil**



Source: PEFC (2019).

Graphic 26 - **Forest area certified with Cerflor seal in Brazil, per State in 2017**



Source: INMETRO/Cerflor (2018).

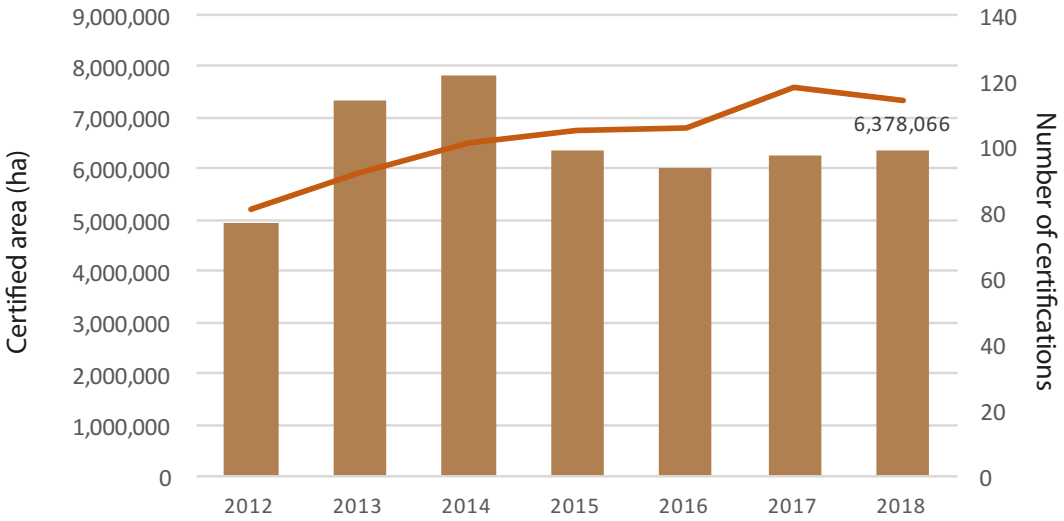
FSC – Forest Stewardship Council

The FSC aims at the dissemination of good forestry practices according to principles and criteria that bring together ecological safeguards, social benefits and economic viability, and are the same for the whole world.

It is an independent, non-governmental, non-profit organization created to promote responsible forest management around the world. In Brazil, the Brazilian Forest Stewardship Council (FSC Brazil) was formalized in 2001.

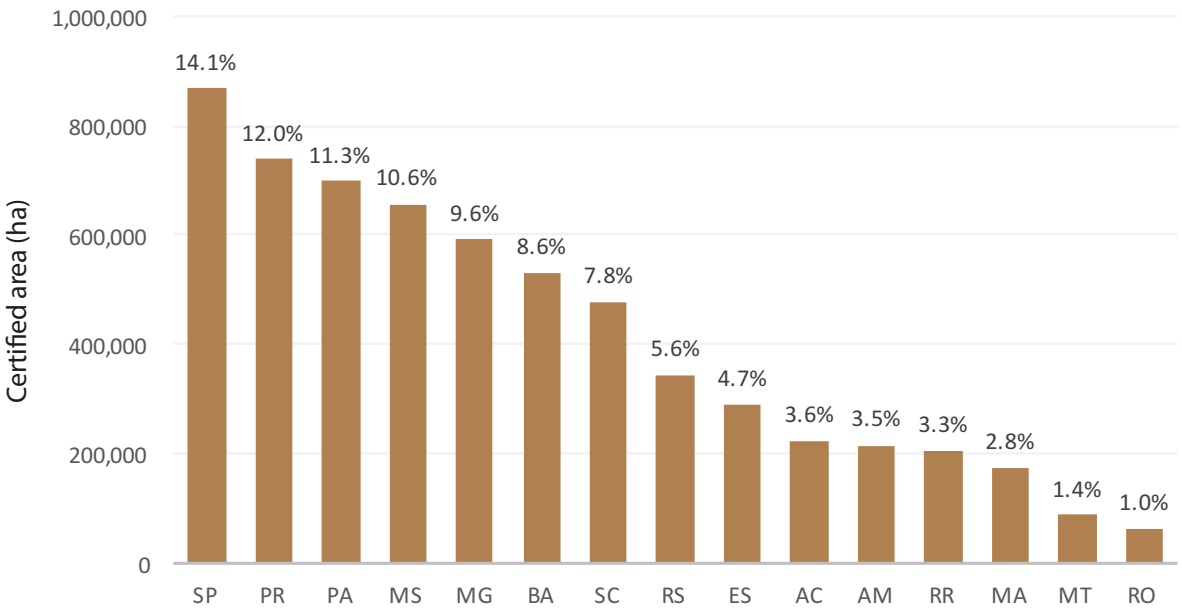
In January 2018, Brazil had 6,378,066 million hectares certified in the forest management modality, which involves 114 management operations, including areas of native forests and forest plantations. The country occupies the 7th place in the total ranking of the FSC system. In the chain of custody mode, Brazil has approximately 1,016 certificates.

Graphic 27 - **Evolution of the number of FSC certificates and certified area in Brazil**



Source: PEFC (2018).

Graphic 28 - **Forest area certified by FSC in Brazil, per state**



Source: FSC (2017).

Forest Financing

Forest Credit

To meet the great demand for information on how to finance the various forestry activities (such as reforestation of Legal Reserves and Permanent Preservation Areas; planting native species; implementation of agroforestry and silvopastoral systems; industrial forest plantations in order to supply mainly demands for charcoal, energy and wood pulp), the Brazilian Forest Service prepared a Forest Financing Guide, which provides key information about credit lines and financing programs, beneficiaries, value limits, interest rates, reimbursement terms and grace periods, safeguards and financial agents that operate them.

Registration for forest financing concession- Pará

Forest Credit Lines and Programs

Credit lines and programs

Beneficiaries

Goal

Financial agent

Pronaf Floresta

Family farmers in Pronaf.

Management plan; ecologically sustainable extraction; agroforestry systems; enrichment of forest areas; conservation and restoration of PPA and LR, and recovery of degraded areas.

BB, Basa, BNB, OSCIP* and credit cooperatives*.

Pronaf Eco

Family farmers in Pronaf.

Silviculture; compliance with environmental legislation; sustainable forest management plans; restoration of LR, PPA; and recovery of degraded areas; implantation of tree seedling nurseries ; implementation of palm tree and rubber tree plantations.

BB, Basa, BNB, OSCIP* and credit cooperatives*.

PRONAF custeio

Family farmers in Pronaf, except Groups "A" and "A/C".

Plantation of forest species; cultivation of agro-ecological or transition-based production systems.

BB, Basa, BNB, OSCIP* and credit cooperatives*.

Pronaf Produtivo Orientado

Family farmers in Pronaf eligibles to access Constitutional Financing Funds.

Implementation, expansion or modernization of rural infrastructure; farming payment of technical assistance and rural extension services.

BB, Basa, BNB, OSCIP* and credit cooperatives*.

Programa ABC

Individual farmers, cooperative of farmers and corporate farming.

Regularization of rural properties to the environmental legislation (ABC Ambiental); implementation and management of industrial forests (ABC Florestas); implementation of integrated crop-livestock--forest systems and agroforestry systems (ABC Integração); implementation and management of palm tree plantations (ABC Dendê).

Network of institutions accredited to BNDES.

BNDES Florestal

Public and private corporations, individual entrepreneurs, associations and foundations.

Forest management; Reforestation and recovery of degraded lands, including Permanent Preservation Areas and Legal Reserves; Planting forests for multi purpose end uses.

BNDES and other financial institutions accredited to BNDES.

BNDES Meio Ambiente

Public and private corporations, individual entrepreneurs, associations and foundations.

Erosion control; Conservation and restoration of Permanent Preservation Areas and Legal Reserves; Recovery of degraded native vegetation.

BNDES and other financial institutions accredited to BNDES.

BNDES – Climate Fund Program – Anti-desertification Program

Individual farmers, cooperative of farmers, public and private corporations.

Restoration of native vegetation and sustainable production(fruits, fibers and native timber).

BNDES and other financial institutions accredited to BNDES.

BNDES – Climate Fund Program – Native Forests

Public and private corporations.

Sustainable forest management; Forest plantation with native species; restoration of native vegetation, including Areas of Permanent Preservation and Legal Reserve; Support to the productive chain of timber and non-timber products of native species; Technological development.

BNDES and other financial institutions accredited to BNDES.

FCO Verde Conservation of Nature

Individual farmers, cooperative or association of farmers, farming corporations.

Low-impact sustainable forest management; Regularization and recovery of degraded areas, legal reserves and permanent preservation areas; Agroforestry systems; forestation and reforestation; Implementation of regional nurseries to supply seedlings; Implantation of permanent crops for phytotherapeutic, food and energy use; Expenses with land regularization.

BB; BRB; Goiás Fomento; Bancoob; Sicredi; BRDE; MT Fomento.

FCO Verde Integrated Crop-Livestock-Forestry System

Individual farmers, cooperative or association of farmers, farming corporations.

Implementation of integrated crop-livestock-forest systems. Improvement of production yields in deforested areas.

BB; BRB; Goiás Fomento; Bancoob; Sicredi; BRDE; MT Fomento.

FNE Verde

Individual farmers, cooperative or association of farmers, rural corporations.

Forest management, reforestation, agroforestry and crop-livestock-forest systems; Seed and seedlings production; Agroecological production, organic production systems, including food processing.

Banco do Nordeste do Brasil (BNB).

FNO Programa ABC

Individuals and private entities, including indigenous peoples of the Amazon, not contemplated by PRONAF; entrepreneurs, associations and cooperatives.

Aforestation and reforestation of degraded lands; restoration of Permanent Preservation Areas and Legal Reserves; implementation of integrated crop-livestock-forest systems and agroforestry systems.

Banco da Amazônia.

FNO Biodiversidade

Individuals and private entities, including indigenous peoples of the Amazon, not contemplated by PRONAF; entrepreneurs, associations and cooperatives.

Sustainable forest management; Conservation and restoration of native vegetation, ecosystem services, wildlife, medicinal and aromatic plants; conservation and protection of water springs and water bodies.

Banco da Amazônia S.A.

FNO Amazônia Sustentável

Individual farmers, cooperative or association of farmers; private companies; and public corporations not dependent on federal resources.

Industrial processing of timber and non-timber forest products from sustainable forest management, reforestation or restored areas.

Banco da Amazônia S.A.

Source: SFB (2016).
Note: * By mandate / ** Except in the Midwest region, where BB is manager of FCO.

Visit:
http://www.florestal.gov.br/financiamento-florestal

FOREST EDUCATION AND RESEARCH

Jamari National Forest - State of Rondonia

Main Research Centers

Forest Products Laboratory - LPF - Created in 1973, it is a R,D&I specialized center of the Brazilian Forest Service responsible for technology transfer to the forest-based sector. The priority research lines are:

- Technological Characterization of Forest Products;
- Energy and Climate Changes;
- Forest products end-uses; and,
- Residues/waste utilization.

Brazilian Agricultural Research Corporation –

Visit:
http://www.florestal.gov.br/laboratorio-de-produtos-florestais

SFB Wood collection - Brasília/DF

Embrapa - attached to the Ministry of Agriculture, Livestock and Food Supply, it was created in 1973. Its mission is to enable research, development and innovation solutions for the sustainability of agriculture, for the benefit of the Brazilian society. Embrapa has several specialized research centers. Among those are centers focused on forests:

- Embrapa Acre - Rio Branco/AC
- Embrapa Agrosilvopastoril – Sinop/MT
- Embrapa Amapá – Bailique/AP
- Embrapa Amazônia Ocidental- Manaus/AM
- Embrapa Amazônia Oriental - Belém/PA
- Embrapa Florestas - Colombo/PR
- Embrapa Rondônia - Porto Velho/RO

National Institute of Amazonian Research - INPA – attached to the Ministry of Science, Technology, Innovation and Communication, it was created in 1952. It conducts scientific studies on the biophysics and living conditions of the Amazon region aiming to promote human well-being and regional socioeconomic development. Currently, INPA is a world reference in tropical biology. INPA's forest research lines are the following:

- Management of Amazon Forests: Ecology, Physiology and Soils;
- Silviculture: Tropical Silviculture, Genetic Resources; Tree breeding of native species; Agroforestry Systems; and Recovery of Degraded Areas;
- Conservation of Natural Resources: Conservation of biodiversity; uses of flora and fauna resources, impact analysis, traditional management, new technologies.

Institute for Technological Research of the State of São Paulo - IPT – attached to the State Department of Economic Development, Science, Technology and Innovation, its mission is to produce and transfer technologies for many different sectors, including the timber production chain. Its Forest Resources Technology Center develops activities in the following areas:

- Forests and wood productive chains: sustainable technologies;
- Wood and related products;
- Cellulose and paper;
- Wood preservation and biodegradation of materials.

Financing of Forest Research

Coordination for the Improvement of Higher Education Personnel (Capes) – As a foundation of the Ministry of Education, Capes plays a key role in the expansion, consolidation and continuous improvement of the stricto sensu postgraduate courses (master's and doctoral) in Brazil.

National Council for Scientific and Technological Development (CNPq) - Science, Technology, Innovation and Communications, CNPq is responsible for fostering scientific and technological research and supporting training of Brazilian researchers.

Research and Innovation Fund (Finep) - This agency provides public funding for Science, Technology and Innovation at companies, universities, technological institutes and other public or private institutions. Finep also supports the incubation of technology-based companies, the implementation of technology parks, the structuring and consolidation of research processes, and the development of new markets.

State Research Support Foundations (FAPs) - state agencies responsible for inducting and promoting research, development and innovation. All the Federation Units, except Roraima, have a scientific foundation.

SFB Wood collection - Brasília/DF

Main Brazilian Journals on Forest Sciences

The main Brazilian scientific journals that publish forest matters are:

- **Revista Acta Amazônica - INPA**
  INPA http://acta.inpa.gov.br/
- **Revista Árvore UFV**
  http://revistas.cpd.ufv.br/arvoreweb/index.php
- **Revista Cerne UFLA**
  http://www.cerne.ufla.br/site/index.php/CERNE/index
- **Ciência Florestal UFSM**
  http://cascavel.ufsm.br/revistas/ojs-2.2.2/index.php/cienciaflorestal/index
- **Floresta e Ambiente - UFRRJ**
  http://www.floram.org/
- **Revista do Instituto Florestal - IF**
  http://www.iflorestal.sp.gov.br/publicacoes/revista_if/index.asp
- **Scientia Forestalis - IPEF**
  http://www.ipef.br/publicacoes/scientia/
- **Revista Floresta - FUPEF**
  http://revistas.ufpr.br/floresta/index
- **Rodriguésia - Revista do Jardim Botânico do Rio de Janeiro - JBRJ**
  http://rodriguesia.jbrj.gov.br/
- **Revista de Ciências Agrárias - UFRA**
  http://agraria.pro.br/sistema/index.php?journal=agraria
- **Pesquisa Florestal Brasileira - Embrapa Florestas**
  http://pfb.cnpf.embrapa.br/pfb/index.php/pfb/index

Visit:
http://snif.florestal.gov.br/pt-br/revistas-sobre-ciencias-florestais

Forest Education

Graduation

Forest-related education in Brazil began in 1960, when the first undergraduate course in Forest Engineering started. It evolved in the following years with the creation of 7 new schools in the 1970s, 5 more in the 1980s and another 5 in the 1990s. In the year 2000, Brazil had 20 Forest Engineering schools.

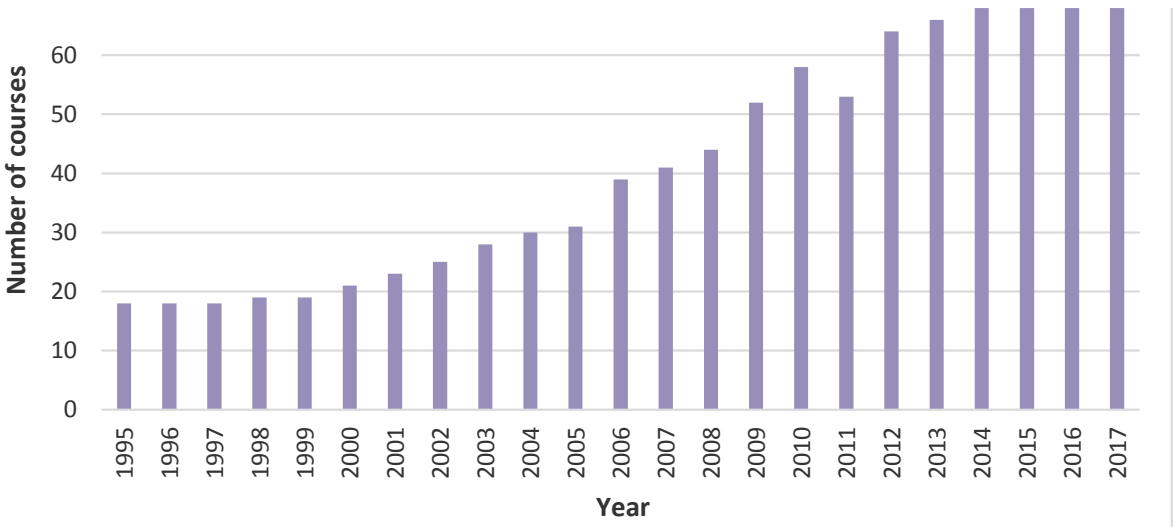
According to a survey from the National Institute for Educational Studies and Research *Anísio Teixeira* – INEP, upon the Higher Education Census of 2017, the number of education institutions teaching Forest Engineering has increased. There are **62 Higher Education Institutions** with **72 undergraduate courses**, on-campus, spread over the country.

Table 44 - **Situation of students in 2017**

	Quantity
Enrolled	13,226
Graduated	1,850

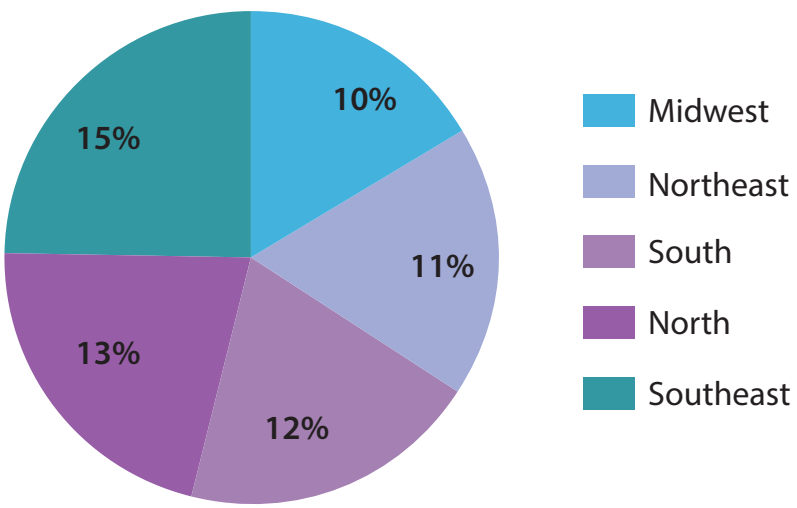
Source: INEP-MEC (2018).

Graphic 29 - **Number of Forest Engineering courses in Brazil**



Source: INEP-MEC (2018).

Graphic 30 - **Distribution of Higher Education Institutions, per administrative region in 2017**



Source: INEP-MEC (2018)

Visit:
http://snif.florestal.gov.br/pt-br/graduacao

Post-Graduation

In 2017 there were 11 postgraduate programs in Forest Engineering and Forest Sciences, accounting for 43 courses at 23 institutions.

Information about postgraduate courses in Brazil is made available by CAPES/Ministry of Education.

Figure 17 - **Dynamics of postgraduate programs in Forest Engineering and Forest Resources**

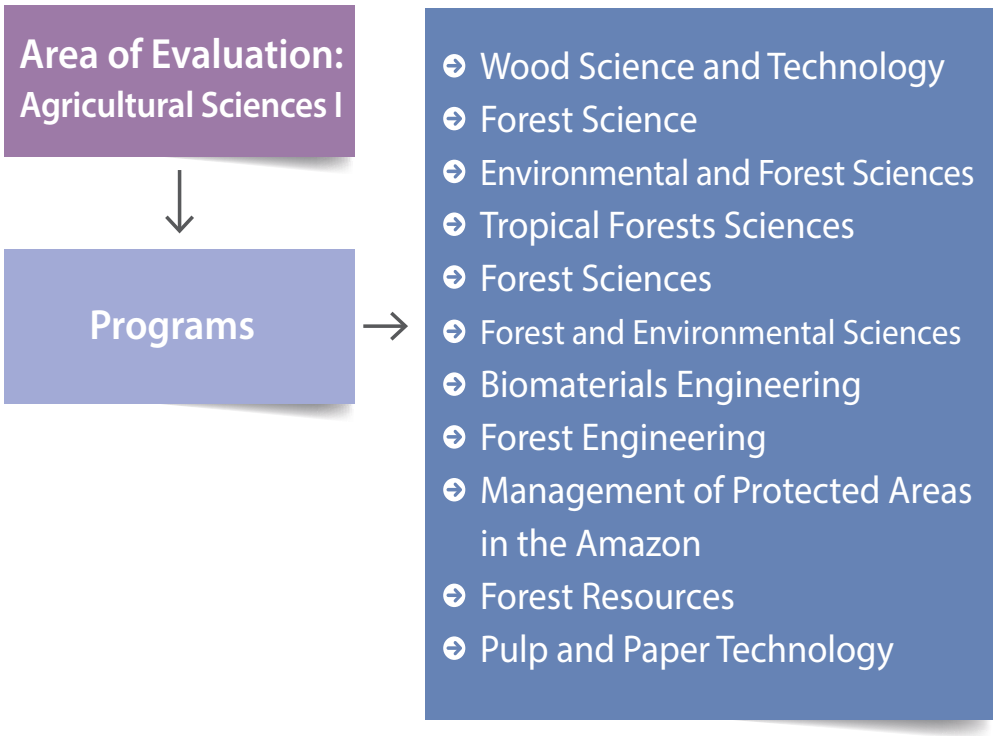
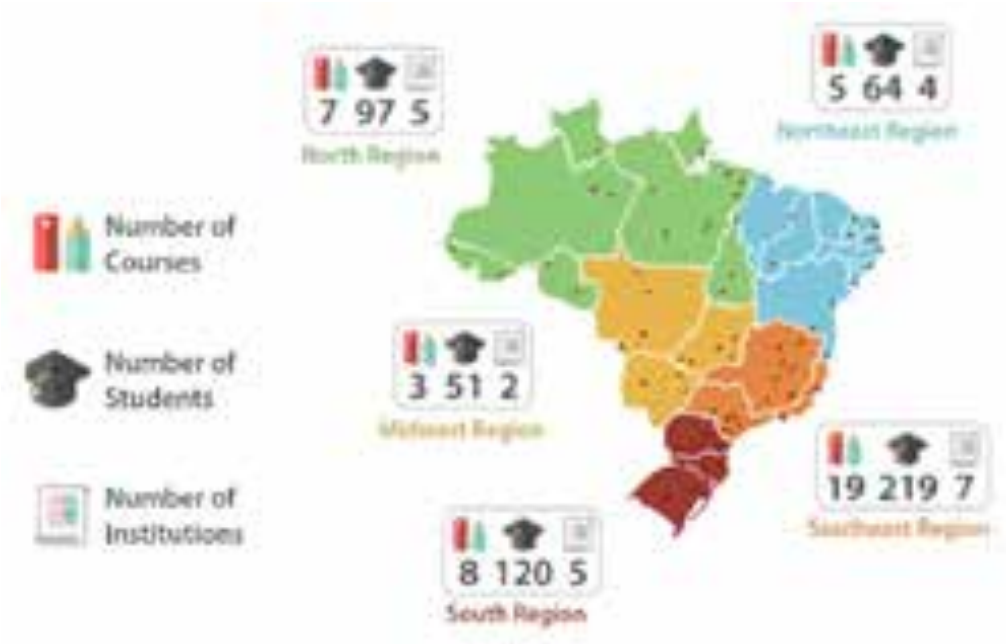


Figure 18 - **Postgraduate courses in Forest Engineering, in 2017**



Source: GeoCAPES (2018)

Capacity building in Embrapa Cenargen/State of Goiás

Table 45 - **Number of teachers in the postgraduate modalities, in 2017**

Year	Nature Conser-vation	Forest Manage-ment	Forest Resources and Forest Engineering	Pulp and Paper Techno-logy	Total Teachers
2006	0	24	244	0	268
2007	0	24	304	0	328
2008	0	21	339	0	360
2009	0	22	344	11	377
2010	45	21	361	11	438
2011	45	21	388	11	465
2012	43	21	426	11	501
2013	0	0	524	0	524
2014	0	0	572	0	572
2015	0	0	517	0	517
2016	29	21	491	10	551
2017	0	0	571	0	571

Source: GeoCAPES (2018).

Capacity building in the Forest Products Laboratory/SFB - Brasília/DF

The tables below show the number of students enrolled and graduating in the postgraduate modalities, as follows:

Table 46 - **Number of students enrolled in forest engineering postgraduate courses in Brazil**

Modality	2007	2008	2009	2010	2011	2012
Master's degree	501	550	621	755	749	792
Professional Master's degree	0	17	20	41	55	52
Doctorate degree	341	371	426	474	540	548
Modality	**2013**	**2014**	**2015**	**2016**	**2017**	
Master's degree	855	874	858	840	769	
Professional Master's degree	50	46	32	39	38	
Doctorate degree	600	607	643	703	703	

Source: GeoCAPES (2018).

Table 47 - **Number of graduates in forest engineering postgraduate courses in Brazil**

Modality	2007	2008	2009	2010	2011	2012
Master's degree	179	192	239	258	383	440
Professional Master's degree	0	0	1	16	24	12
Doctorate degree	59	64	63	108	93	129
Modality	**2013**	**2014**	**2015**	**2016**	**2017**	
Master's degree	382	418	309	406	387	
Professional Master's degree	21	18	16	12	13	
Doctorate degree	122	161	122	116	160	

Source: GeoCAPES (2018).

Visit:
http://snif.florestal.gov.br/pt-br/pos-graduacao

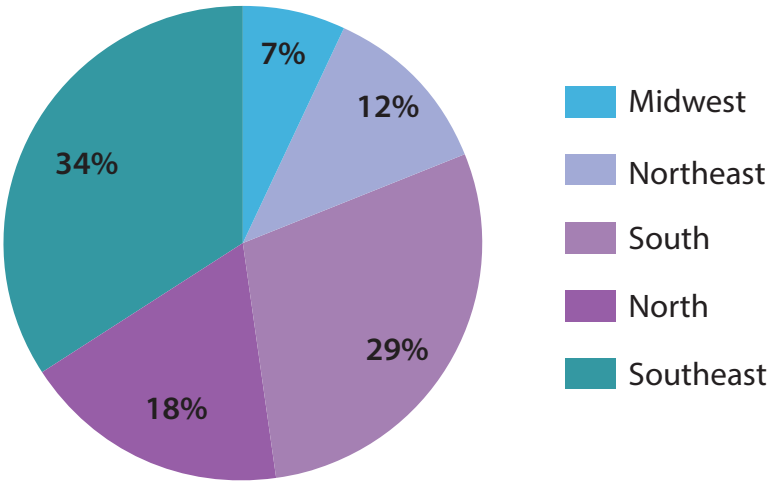
Technical education courses

High-school level technical courses enable the students to perform professional work, being, as they are, the last step of the basic education. Professional Education at High-school level can be either articulated within the regular course or simultaneous to it.

According to the last update of the National Registry of Technical Courses, in 2014, forest-related technical courses length can vary from 1 to 3 years, and the course load can vary from 800h to 1200h. Today they have 7 professionalizing options: Carpentry Technician, Geo-processing Technician, Furniture Design Technician, Pulp and Paper Technician, Furniture Technician, Forest Technician and Wood Processing Technician.

The National System of Information on Professional and Technical Education indicates that there are 212 technical forest-related courses in Brazil.

Graphic 31 - **Number of Technical education courses in 2017**



Source: INEP-MEC (2018)

Visit:
http://snif.florestal.gov.br/pt-br/nivel-medio

Capacity building provided by the Brazilian Forest Service - Bothanic Garden of Brasília/DF

Higher Education Technological Courses

Higher Education Technological Courses are undergraduate courses that can be offered by universities, academic centers, colleges and higher education institutes, and lead to a technologist degree.

Information about these courses are made available by the National Institute for Educational Studies and Research – INEP, from the Ministry of Education.

Visit:
http://snif.florestal.gov.br/pt-br/tecnologico

Figure 19 - **Distribution of forest-related Higher Education Technological Courses**

Source: INEP-MEC (2018)

Table 48 - **Forest-related Higher Education Technological Courses, by region, in 2016**

Administrative Region	Quantity
Midwest	3
Northeast	2
North	1
Southeast	5
South	3
Total	14

Source: INEP-MEC (2018).

Table 49 - **Type of institution per category, in 2016**

Type of Institution	Quantity
Private for profit	1
Private non-profit	3
State Public	2
Federal Public	8
Total	14

Source: INEP-MEC (2017).

Table 50 - **Students situation in 2016**

Type	Quantity
Enrolled	1,175
Incoming	418
Graduates	103

Source: INEP-MEC (2018).

Non-formal courses

Tropical Forest Institute

The Tropical Forest Institute (IFT) is a center of excellence in promoting the sustainable forest management of the Amazon.

The institute provides on-site practice experience, as well as the theoretical base for application of the reduced-impact logging for government agents, timber industry workers, indigenous people, small-scale farmers, technical and undergraduate students, and others attend the courses.

From 2013 to 2017 IFT trained 1,532 forest-related professionals.

Table 51 - **Number of trained professionals**

Course	2013	2014	2015	2016	2017
GE - LManagement of Logging Operations	184	77	55		23
GM - Forest Management under Reduced Impact Logging	10	10			
MF - Reduced Impact Logging for Technicians	72	34	32	34	36
TA - Principles of Forest Certification	14			20	
TCS - Tree Felling Techniques and Safety Operations	64	41	62	78	38
TD - Sustainable Forest Management for Decision-Makers	16	50	29	16	
TD-W - Sustainable Forest Management On-site Workshop for Decision-Makers	47			12	
TI - On-site Tree Taxonomy	23			25	
TOA - Skidding Operation Techniques	42	21	40	26	11
TOI - Planning and Construction of Log Yards, Forest Roads and Other Infrastructures	33	21	20	12	10
TPE - Pre-Logging Techniques	108	26	25	35	
Total	**613**	**280**	**263**	**258**	**118**

Source: IFT (2018).

Pau Brasil Tree - Atlantic Forest

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Flower of the Cerrado Biome - DF

Araucaria - Campos do Jordão/State of São Paulo

Appendice A

Table 52 - **Main national statistics (2013-2018)**

Total population (2018)	208 million
Total area (2018)	851 million ha
Total forest area (2018)	498 million ha
Proportion of forest area compared to the total area	58.47 %
Forest area per inhabitant	2.39 ha
Natural forests area (2018)	488 million ha
Forest plantations area	9,8 million ha
Federal Conservation Units area	171.8 million ha
Indigenous Lands area	117.1 million ha
Registered public forests area	309. 2 million ha
Federal community forest area	157.4 million ha
Federal and State public forests area under forest concession -2018	1.52 million ha
Formal employments in forest sector (2018)	423 thousand
Certified forests area – CERFLOR (2018)	3.07 million ha
Certified forests area – FSC (2018)	6.3 million ha
Sawnwood production (2017)	8.5 million m^3
Pannel production (2017)	11.0 million m^3
Pulp production (2017)	27.1 million ton
Paper production (2017)	25.3 million ton
Extraction of roundwood for fuel (2017)	123.8 million m^3
Extraction of roundwood for industry (2017)	152 million m^3
Yerba mate (2017)	354 thousand ton
Acai berry (2017)	215 thousand ton
Babassu almond (2017)	54.3 thousand ton
Piaçava fiber (2017)	9.8 thousand ton
Brazilian nut (2017)	26.2 thousand ton
Exports of forest sector (2017)	9.4 billion US$
Imports of forest sector (2017)	0.79 billion US$
Main importers of forest products from Brazil in 2017	
China	2.8 billion US$
United States	2.1 billion US$
Netherlands	0.8 billion US$

Annex A

International Forest Data Comparison

Table 53 - **The 10 nations with the largest area of forest in 2015**

Country	Forest area (1,000 ha)	Country area %
1 Russia	814,931	49.8
2 Brasil	493,538	59.0
3 Canada	347,069	38.2
4 United States	310,095	33.8
5 China	208,321	22.1
6 Congo	152,578	67.3
7 Australia	124,751	16.2
8 Indonesia	91,010	53.0
9 Peru	73,973	57.8
10 India	70,682	23.8

Source: FAO (2015).

Table 54 - **The 10 nations with the largest area of planted forest in 2015**

Country	Forest area (1,000 ha)
1 China	78,982
2 United States	26,364
3 Russia	19,841
4 Canada	15,784
5 Sweden	13,737
6 India	12,031
7 Japan	10,270
8 Poland	8,957
9 Brazil	7,736
10 Finland	6,775

Source: FAO (2015).

Table 55 - **The 10 nations with the bigest forest carbon stock and biomass in 2015**

Country	Carbon stock (million ton)
1 Brazil	59,222
2 Russia	32,800
3 Democratic Republic of Congo	19,441
4 United States	17,330
5 Indonesia	12,488
6 Colombia	8,867
7 China	6,787
8 Papua New Guinea	6,610
9 Tanzania	5,438
10 Guiana	4,809

Source: FAO (2015).

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Cover picture: Monte do Carmo/TO

Graphic design: Selene Fortini e Rafael Menezes de Oliveira

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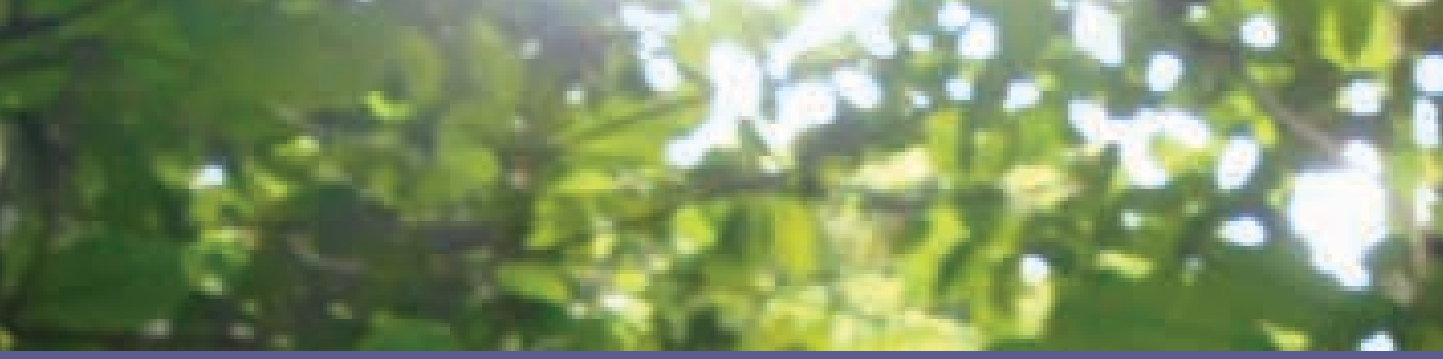

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