Brazil REDD+ Results Based Payments
Use of Proceeds towards Floresta+ Pilot Program and ENREDD+ Implementation +

Environmental and Social Impact Assessment Study

4.October.2021

MINISTÉRIO DO MEIO AMBIENTE

PÁTRIA AMADA BRASIL GOVERNO FEDERAL

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TECHNICAL TEAM

IDAD (Institute for Environment and Development), located in the city of Aveiro in Portugal, in partnership with the Acariquara Institute (Manaus-Amazonas) was contracted by UNDP to prepare the Environmental and Social Impact Assessment and the Environmental and Social Management Plan of the Floresta+ Amazon Pilot Project.

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EXECUTIVE SUMMARY

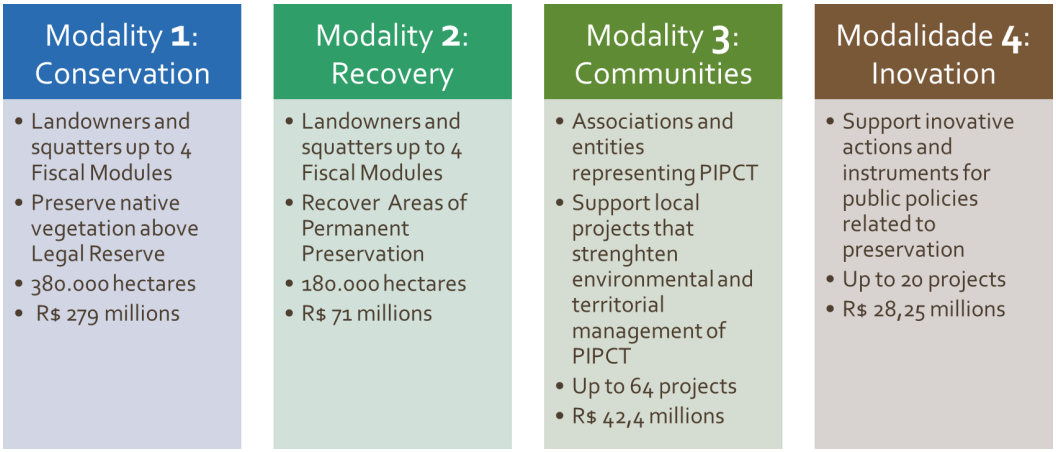
The Floresta+ Amazônia Pilot Project aims to promote the necessary incentives for the conservation and restoration/recovery of areas in small agricultural properties, in addition to the federal legislation, as well as in the collective territories of indigenous peoples and traditional communities. Floresta+ will promote the sharing of benefits as an incentive mechanism and will also contribute to the development of technological solutions for innovation in the forestry sector. The project also aims to contribute to the implementation of ENREDD+ considering the complexity of a forest monitoring system for the entire Brazilian territory. Investments in positive incentives are critical to maintaining and further expanding the REDD+ results achieved in the Amazon region.

As an Accredited Entity by the GCF, the United Nations Development Program is the implementation partner of this project and implements it in technical partnership with the Ministry of the Environment (MMA).

All information about the Floresta+ Amazônia Pilot Project can be found at:

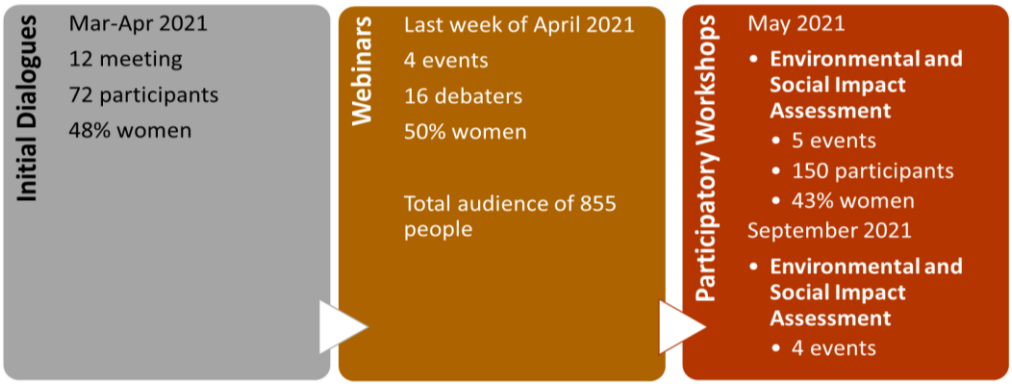
https://www.br.undp.org/content/brazil/pt/home/projects/projeto-piloto-floresta-- amazonia1.html

The Floresta+ Amazônia Pilot Project has 4 different Modalities:

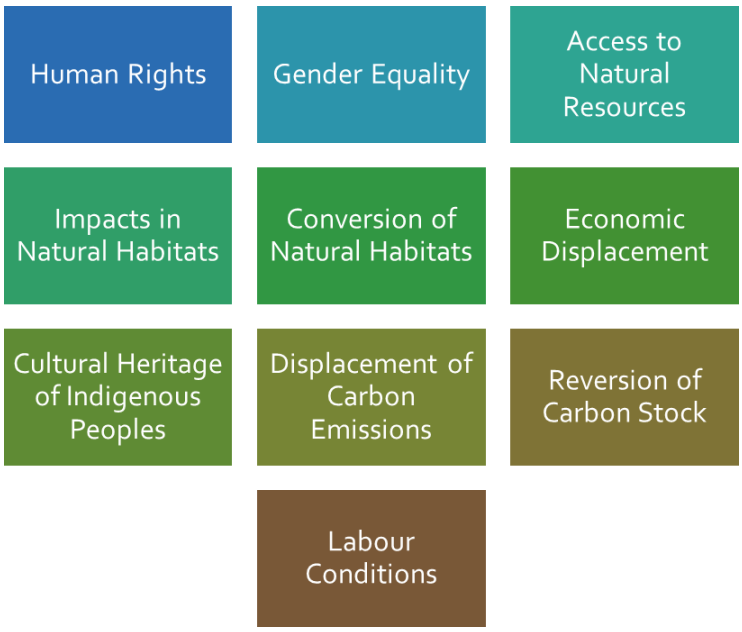


The Environmental and Social Impact Assessment process followed 3 phases:

This document represents the final version of the Environmental and Social Impact Assessment Study. The process was accompanied by an intense process of engagement and dialogue with stakeholders:

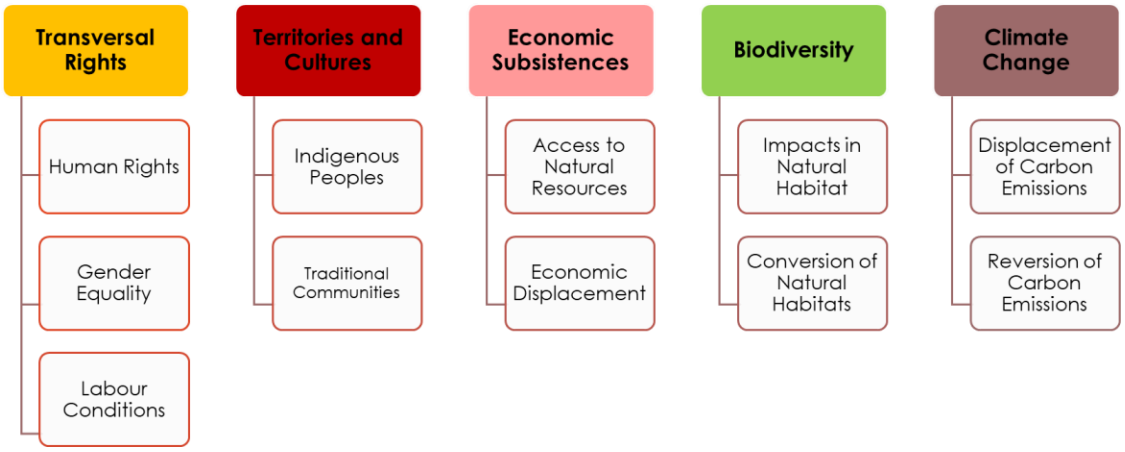


The risk assessment was developed in September 2018 and revised in March 2021 using the UNDP Environmental and Social Screening process. From this process, the existence of potential risks on some issues was concluded



Risks are understood to be the consequences that uncertainties can have on the fulfillment of the objectives of the Floresta+ Amazônia Pilot Project. The prior identification of these risks is of utmost importance for the success of Floresta+.

The risks identified through the Risk Assessment were structured into 5 themes that served as analytical dimensions to organize the Impact assessment. These 5 themes encompass the issues considered as critical to ensure good decision-making:



The process of identifying environmental and social effects began with an analysis of the perceptions of stakeholders with whom different forms of dialogue were established. General perceptions about the entire Floresta+ Pilot Project, and perceptions about each of its Modalities.

In contrast to a more traditional structured methodology for assessing impacts on various environmental factors (e.g. human rights, biodiversity, climate change, etc.), an assessment exercise has been developed that follows the planned action plan for implementation of each Modality. The sequence of actions used includes only those actions that are considered relevant for impact assessment and represents a simplified sequence compared to the detailed definition included in the Project Operational Manual.

The effects of Floresta+ were classified as:

Positive effects		
Positive impact	The project promotes a direct benefit	P
Opportunity	The project fosters favorable circumstances for the realization of a possible benefit	O
Negative effects		
Negative impact	The project promotes the occurrence of damage	N
Risk	The project fosters circumstances favorable to the occurrence of possible damage	R
Context problem	Pre-existing situation that affects project implementation and/or achievement of its objectives/targets	C

One of the most important findings is that the Floresta+ Pilot Project has a preponderance of positive social and environmental effects. The positive impacts are a direct result of the objectives of the Floresta+ Amazônia Pilot Project: encouraging the implementation of the Law for the Protection of Native Vegetation, the promotion of environmental services, the emergence of a new form of income, the improvement of the quality of life of the beneficiaries or, among other positive effects, the contribution to climate stability. In short, to keep "the forest standing". These positive impacts can be considered as being transversal to the various Modalities of the project.

Negative impacts, that is, direct negative consequences resulting from project implementation, are practically non-existent.

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However, it is advisable not to neglect a wide range of risks and context problems that have been identified and that may affect, or even make impossible, the expected success with the project's implementation.

The critical points for Modalities 1 (Conservation) and 2 (Recovery) are as follows:

- The Rural Environmental Registry (CAR) is based on the implementation of Modalities 1 and 2. The status of the CAR, in particular the numbers of CAR validated, show a huge gap between the number of processes actually validated and the objectives of the Pilot Project.
- Additionally, difficulties in accessing information and the internet were identified by a significant part of the beneficiaries of these two Modalities, which could prevent many of the potential interested parties from participating in Floresta+.
- When adopting payment policies for environmental services, it is important to ensure the continuity ofthese same services; the Floresta+ Pilot Project should reflect on this problem as, otherwise, there maybe a reversal of the environmental benefits at the end of the project.
- The referenced financial value for the payment for environmental services may be insufficient to stimulate the interest of small rural producers and family farmers. This situation should be particularly critical for Modality 2 – Recovery.

Regarding Modality 3 (Communities) the following critical points should be highlighted:

- The default situation of many organizations representing the Indigenous People and Traditional People and Communities (in Portuguese abbreviated as PIPCT) was identified as critical, which could lead to the exclusion of organizations legitimately interested in participating in this process.
- The risk of this initiative was also identified to exacerbate existing land conflicts in the complex socio-ecosystems of the Legal Amazon.
- It will be essential to incorporate indigenous and traditional knowledge in defining project objectives.

A final concern that must be considered is the risk of falling into a complex and bureaucratic process that will alienate many of the potential beneficiaries. It will be essential to create, in a relatively short period, an agile and flexible management structure to manage financial support and monitoring to:

- 80,000 beneficiaries foreseen for Modalities 1 and 2,
- 64 projects to support indigenous peoples and traditional peoples and communities (Modality 3), and
- 20 projects to support the improvement and adoption of innovative instruments for public policies related to the conservation and recovery of forests (Modality 4).

This study evaluates, in addition to alternative zero, a set of 5 programmatic alternatives. From the evaluation made to alternative zero, it was concluded that it is important to create the conditions required for the implementation of the Floresta+ Pilot Project. Its non-implementation would represent the loss of a wide range of social and environmental benefits and would not bring any new compensation.

Of the alternatives analyzed, it is interesting to mention as very interesting the possibility of reducing the geographic coverage of the beneficiaries of Modalities 1 and 2, which would allow accelerating the implementation of the Floresta+ Amazônia Pilot Project. In the opposite direction, the possibility arises of in Modality 3 making a direct monetary payment to the PIPCT, which was considered an undesirable expansion of the social and cultural risks associated with the implementation of this Modality. In fact, there are previous experiences that individual payment generates conflicts between beneficiaries and non-beneficiaries of the same group/territory, posing an important risk to the integrity and sustainability of these groups.

Finally, it should be noted that the assessment exercise of the environmental and social impacts of the Floresta+ Amazônia Pilot Project resulted in the identification of a set of mitigation and enhancement measures, monitoring actions and capacity building and training initiatives. All of this is brought together in the Environmental and Social Management Plan (ESMP), an autonomous document, but which should be considered as an integral part of the process of assessing environmental and social impacts.

1. INTRODUCTION

Brazil's commitments to the Paris Agreement are outlined in its Nationally Determined Contribution (NDC). The Brazilian NDC, presented in 2020, reaffirms the country's commitment to reduce total net greenhouse gas emissions by 37% by 2025, and officially commits to reducing Brazilian emissions by 43% by 2030, based on the year 2005. The NDC also sets out the indicative goal of achieving climate neutrality by 2060 – that is, net zero emissions.

NDC is based on the implementation of various public policies. Within the forest sector, government action has two main guiding instruments.

The first of the instruments is the National Strategy for REDD+ whose objective is to contribute to the mitigation of climate change. The REDD+ initiative is an incentive developed under the United Nations Framework Convention on Climate Change (UNFCCC) to financially reward developing countries for their results in Reducing Greenhouse Gas Emissions from Deforestation and Forest Degradation, considering the role of conserving forest carbon stocks, sustainable forest management and increasing forest carbon stocks (+).

The other instrument of government action for the protection of native vegetation is presented in the Native Vegetation Protection Law (LPVN), which replaced the so-called Forest Code (Law No. 12,651 of May 25, 2012, arising from Bill No. 1,876/99). This legislation established restrictions on the use of certain areas of private property, which must be covered by native vegetation. The Permanent Preservation Areas (APP) and Legal Reserve (RL), as defined by law, must be maintained by the owners. Thus, the LPVN establishes, in the Legal Amazon, the obligation of rural properties to maintain 80% of their area covered by native vegetation, as a Legal Reserve; for areas of Cerrado in the Amazon the percentage is 35% and in the case of properties located in areas of general fields the percentage of protection is 20%. There are some specific items given by law, which constitute exceptional cases.

The LPVN, as well as the recently approved National Policy and Program for Payments for Environmental Services, advocate payments for environmental services as a way to recognize the efforts of local producers and communities in the conservation and recovery of native vegetation.

The Floresta+ Amazônia Pilot Project has two components:

1. The development of a pilot of an Environmental Services Incentive Program for the Conservation and Recovery of Native Vegetation (Floresta+); and
2. Strengthen the implementation of Brazilian ENREDD+ through improvements in its structure and governance systems.

These two results will contribute to the achievement of the overall objectives of the country's ENREDD+ and NDC. The first of these components is the object of this environmental and social impact assessment and aims to create an efficient mechanism for payments for environmental services so that small farmers, indigenous peoples and traditional peoples and communities can maintain, manage and restore their territories through the economic incentives received. The Floresta+ Amazônia pilot project will also contribute to innovation in the forestry sector.

Financing for Floresta+ Amazônia was obtained from the Green Climate Fund (GCF) based on REDD+ results achieved by Brazil in the Amazon biome in 2014 and 2015. Brazil became the first country to receive financial resources from the GCF for having successfully reduced greenhouse gas emissions from deforestation in the Amazon. It should be noted that the Floresta+ Amazônia Pilot Project is a global pioneer in terms of payment for environmental services.

It should be kept in mind that the Green Climate Fund is an initiative to respond to the challenges of global climate change, investing in low carbon development and climate resilience. Established by 194 countries, the initiative works to limit or reduce greenhouse gas emissions in developing countries. With the financing of programs and projects, the entity collaborates directly with the reduction of climate impacts and with the countries' resilience.

The Floresta+ Pilot Project Operation Manual (MOP version 1.1) states that "investments in positive incentives are essential to maintain and further expand the REDD+ results achieved in the Amazon region. This would contribute to reducing pressure on native forests, consistent with ongoing efforts to eliminate illegal deforestation and promote ecosystem recovery, which is part of the overall objective of ENREDD+ and the Sustainable Development Goals (SDGs)."

Floresta+ Amazônia was structured in four Modalities covering a wide range of beneficiaries. The diagram in Figure 1-1 provides a quick representation of the 4 Modalities.

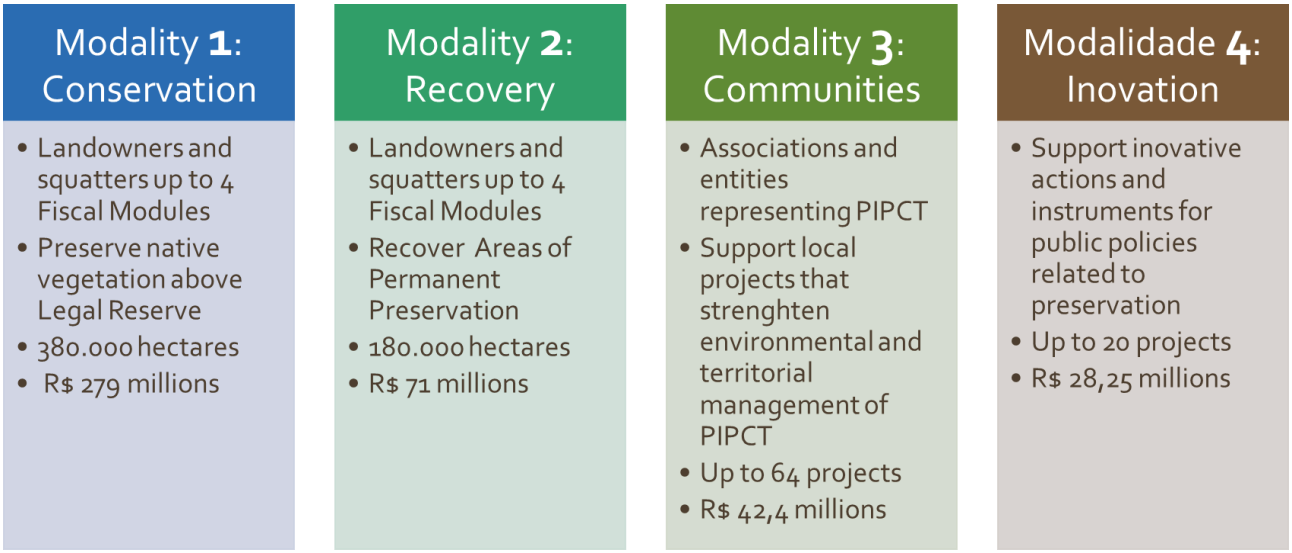


Figure 1-1 - General structure of the Floresta+ Amazônia Pilot Project Modalities: beneficiaries, objectives, financial resources.

The main objective of this study is to develop an Environmental and Social Impact Assessment (ESIA) by independent experts in a participatory manner with stakeholders during the initial phase of the project and as part of the preparatory activities of the Pilot Project. The assessments are being conducted in accordance with national regulations and the UNDP Environmental and Social Standards and will lead to the development of appropriately sized measures and management plans to address identified risks and impacts with a focus on project actions.

The results of the environmental and social assessment and the design of appropriate mitigation and management measures will be completed, disseminated and discussed with stakeholders prior to implementing any activities that may cause adverse social and environmental impacts.

The study will culminate in the development of a complete Environmental and Social Management Plan (ESMP) and, if deemed necessary, specific management plans (e.g. Stakeholder Engagement Plan, Livelihood Action Plan, Indigenous Peoples Plan, etc.).

This report presents the preliminary version of the Environmental and Social Impacts Study.

2. LEGAL AND INSTITUTIONAL FRAMEWORK

2.1 BRAZILIAN LEGISLATIVE FRAMEWORK

This section provides a preliminary review of the policy, legal and institutional (PJI) framework correlated to the potential risks and benefits of the proposed Floresta+ project and the prospective activities to be implemented using the proceeds. The PJI framework supports how social and environmental Safeguards will be addressed and respected.

The section includes (a) the country's applicable policy framework (e.g. national laws and regulations) relating to relevant social and environmental issues; country obligations directly applicable to the project under relevant international treaties and agreements; b) the likely requirements applicable under the UNDP SES; and (c) the Cancun Safeguards in the Brazilian context.

This analysis will be further expanded in the ESMP from information obtained in the ESIA, to compare national PJIs to social and environmental standards, as appropriate to specific Floresta+ activities and to indicate institutional and operational capacities and/or shortcomings, with recommendations to address gaps or identified shortcomings, when appropriate.

In addition to the safeguard provisions outlined in the ESMF, Brazil has embarked on a process to address and respect safeguards in the implementation of REDD+ policies and measures set out in the National Strategy for REDD+ (ENREDD+). The policy, legal and institutional framework was described, and the challenges associated with the implementation of safeguards were identified in the second SOI, with the logic of recognizing them as essential for the implementation of ENREDD+ and REDD+ safeguards to overcome them. This analysis helped to inform the benefit and risk assessment conducted for this proposal.

Brazil has been a pioneer in regulatory and institutional arrangements for the monitoring and conservation of tropical forests in the Legal Amazon. These include:

- Law 12.651 of May 25, 2012 (Forest Code): demonstrates Brazil's sovereign commitment to the protection of native vegetation and the integrity of the climate system for the well-being of present and future generations. This law establishes administrative restrictions on the use of certain areas of native vegetation within private properties. The Permanent Preservation Areas (APP) and Legal Reserve(RL), as they are called by law, must be maintained by rural landowners. The proportion of RL areas depends on the region where the rural properties are located. In the Legal Amazon, the RL value corresponds to 80% of the property located in forest areas, 35% of which are in savanna (Cerrado) areas and 20% for pasture. In all regions outside the Amazon biome, the RL share is 20%. TheForest Code also established mandatory registration in the Rural Environmental Registry (CAR) for all rural properties (Article 29, Law No. 12,651/2012) (source: ENREDD+)
- Decree 8972, of January 23, 2017: its main objectives are to articulate, protect and promote policies, programs and actions to recover forests and other forms of native vegetation; and promote the environmental regularization of Brazilian rural properties, in accordance with the Forest Code.
- The National Determined Contribution (NDC) presented to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) during COP-21 in Paris, to reduce greenhouse gas emissions by 37% by 2025 and 43% by 2030 compared to the year 2005.

Several advances in Brazilian environmental legislation and policies have taken place over the past twenty years, including:

- Environmental Crimes Law (Law No. 9,605/1998) and Decree 6,514 of July 22, 2008
- National System of Conservation Units (Law No. 9,985/2000)
- Law on Access to Data and Information in the bodies and entities that make up the National Environment System - SISNAMA (Law No. 10,650/2003)
- Priority Areas for the Conservation, Sustainable Use and Sharing of Benefits from Biodiversity (Decree No. 5,092/2004 and MMA Ordinance No. 09/2007)

- Public Forest Management Law (Law No. 11,284/2006)
- National Policy for Territorial and Environmental Management of Indigenous Lands – PNGATI (Decree No. 7747/2012)
- Protected Areas Program in the Amazon Region-ARPA (Decree No. 8,505/2015)
- National Policy on Payment for Environmental Services (Law No. 14,119/2021)

These laws and regulations provide a legal basis for combating deforestation, arranging for benefit-sharing mechanisms, managing conflicts and providing guidance on forest infractions. They provide guidelines for the management and development of forest and wildlife resources, including institutional mandates and responsibilities.

The objectives of the National Strategy for REDD+ (ENREDD+) are aligned and integrated with sectoral and geographically defined plans related to deforestation and degradation at the state and biome level.

At the biome level, Brazil has developed and implemented action plans for the Amazon and the Cerrado: The Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAm) and the Action Plan for the Prevention and Control of Deforestation and Slash-burning in Cerrado (PPCerrado). Currently, the federal government's strategy is focused on the National Plan for the Control of Illegal Deforestation and the recovery of native vegetation. These are the main instruments to promote the integration and coordination of REDD+ initiatives in biomes, and due to their relevance, they were incorporated into the PNMC. They interface with the following Sectoral Plans: Mitigation and Adaptation to Climate Change for the consolidation of a Low Carbon Economy in Agriculture (Plano ABC); and Steel Emission Reduction. Together, these plans form the PNMC pillars for mitigation in the LULUCF sector, contributing directly to REDD+.

At the state level, the nine states in the Legal Amazon have similarly structured plans (PPCDs). They define commitments at the state level for forest conservation and recovery of degraded areas, in alignment with the PPCDAm and the PNMC. The plans, prepared by the State Environmental Secretariats (SEMA), have the mandate to expand the scope of actions planned at the federal level, so these actions can be adapted to the different drivers and dynamics of deforestation in municipalities and other territorial units and outline the legislation and subnational regulation.

Each plan outlines state-specific objectives and, using a logical framework, guides the design and prioritization of actions related to preventing deforestation and forest degradation, as well as the allocation of resources and the assignment of responsibilities for implementation. PPCDs include analyses on land tenure issues, forest governance, deforestation dynamics and its main drivers, as well as on indigenous peoples and traditional communities living on the state's borders. Plans are periodically reviewed and updated.

On January 13, 2021, Law No. 14,119/2021 was approved, establishing the National Policy on Payments for Environmental Services. The law establishes the concepts of ecosystem services, distributed in the Modalities of provision, support, regulation and cultural services, and of environmental services as individual or collective activities that favor the maintenance, recovery or improvement of ecosystem services. It creates the Federal Program for Payment for Environmental Services (PFPSA) within the central body of the National Environment System - SISNAMA and establishes that services provided by traditional communities, indigenous peoples, family farmers and rural family entrepreneurs must be prioritized. The law defines that preference should be given to partnerships with cooperatives, civil associations and other forms of association.

Table 2-1 summarizes the main national policies, laws and regulations that support the implementation of actions related to REDD+ and therefore are directly relevant to the project. A key element of Floresta+ will be to support monitoring structures and respect for environmental and social safeguards in the context of ENREDD+ through the Safeguards Information System.

Table 2-1. National Level Laws and Regulations

Laws and Regulations	Description/Objetive
Agricultural Policy Law (Lei da Política Agrícola) (LawNo. 8,171/1991)	Indicates to the public power to provide special incentives to rural landowners who protect and conserve the native forest, adopt conservationist practices and organic agriculture
National Climate Change Fund (Fundo Nacional sobre a Mudança do Clima) (Law No. 12,114/2009) Law 13,800/2019	Allows payment for environmental services to communities and individuals whose activities are proven to contribute to carbon storage, linked to other environmental services; Agroforestry systems and recovery of degraded areas and forest restoration, prioritizing the Reserve area, the Legal and Permanent Preservation Areas and priority areas for generating and guaranteeing the quality of environmental services.
REDD+ National Strategy (ENREDD+) (EstratégiaNacional de REDD+ (ENREDD+)) Decree No. 8,576/2015 and MMA Ordinance No. 370/2015	Contribute to climate change mitigation, eliminating illegal deforestation, conserving and restoring forest ecosystems, and developing a sustainable low-carbon forest economy, generating economic, social and environmental benefits.
Action Plan for Prevention and Control of Deforestation in the Legal Amazon (Plano de Ação para Prevenção e Controle do Desmatamento na Amazônia Legal (PPCDAm))	Deforestation reduction, with targets established until 2020.
National Plan for Control of the Illegal Deforestation and Recovery of Native Vegetation 2020-2023 (Plano Nacional para Controledo Desmatamento Ilegal e Recuperação da Vegetação Nativa 2020-2023)	Deforestation reduction between the years 2020 to 2023
State Plans to Combat Deforestation (PlanosEstaduais de Combate ao Desmatamento (PPCDs))	The objective is to slash-burning and deforestation in each state according to their particularities in line with the National Plan
State Plan for the Prevention and Control of Deforestation and Slash-Burning in the State of Amazonas PPCDQ-AM 2020-2022 (Plano Estadual dePrevenção e Controle do Desmatamento e Queimadas do Estado do Amazonas PPCDQ-AM 2020-2022)	Strengthen environmental governance in the State of Amazonas, control illegal deforestation and encourage the sustainable use of natural resources with an emphasis on critical deforestation areas. Specific objectives: Implement integrated actions aimed at increasing the effectiveness and efficiency of environmental and territorial management in areas under intense pressure for the use of natural resources; Periodically and systematically monitor carbon stocks in the State of Amazonas; Establish local targets for controlling and reducing illegal deforestation; Strengthen the environmental governance structures of municipalities such as municipal bodies and councils for the environment and sustainable rural development; Promote land and environmental regularization actions in priority areas in line with state and federal public policies.
State Plan for the Prevention and Control of Deforestation in Acre. 2010 - current (Plano Estadualde Prevenção e Controle do Desmatamento no Acre.2010 – atual)	Aims to ensure significant, consistent and lasting reductions in deforestation rates in the State of Acre, by strengthening government and society capacities for environmental management and consolidating a Clean, Fair and Competitive Economy with a strong Forestry and Agroecological Base

Laws and Regulations	Description/Objetive
Operational Strategy REDD+ RONDÔNIA. 2020 - 2030 (Estratégia Operacional REDD+ RONDÔNIA. 2020 – 2030)	The general objective is to contextualize the status of REDD+ in Brazil and present the necessary steps for structuring the components thatshould make up the Operational Strategy for REDD+ in Rondônia, in line with the articles of the PGSA. The proposal is to enable social actors in the state of Rondônia to access a new wave of investments and resources aimed at local socioeconomic development, made possible by the valuation of the standing forest in the state of Rondônia and its environmental services. As specific objectives, seek to discuss and present (i) a structure for monitoring, reporting and verifying emission reductions resultingfrom the reduction of deforestation in Rondônia, (ii) an accounting system for REDD+; (iii) integration with national REDD+ policies and frameworks; (iv) the integration of private projects into the state accounting and registration system; (v) integration with the governance bodies provided for by PGSA; and (vi) a model for allocating emission reductions arising from the REDD+ mechanism, aimed at financing and implementing local actions for forest conservation and fostering sustainable productive activities.
Plan for the Prevention and Control of Deforestation and Slash-Burning in the State of Amapá 2010 - 2013(Plano de Prevenção e Controle do Desmatamento e Queimadas do Estado do Amapá 2010 – 2013)	Avoid the increase in CO_2 and other GHG emissions associated with deforestation and slash-burning of native vegetation in the State; Promote the generation of employment and income associated with the conservation of forests and natural landscapes; Strengthen and integrate state forestry, agricultural, land and environmental management systems, with improved governance, computerization and process transparency; Raise awareness and involve segments of society, civil and business, about their respective roles and co-responsibilities in the prevention and control of deforestation and slash-burning; Increase the competitiveness of products from the forestry sector in Amapá, in national and international markets; and Engage the State of Amapá in new mechanisms of international cooperation within the scope of the United Nations conventions on climate change (UNFCCC) and biodiversity conservation (CDB), articulated with the Brazilian government's policy within the scope of these conventions.
State Plan for the Prevention and Control of Deforestation and Slash-Burning in Roraima – PPCDQ/RR. 2019 - 2022 (Plano Estadual de Prevenção e Controle do Desmatamento e Queimadas em Roraima – PPCDQ/RR. 2019 – 2022)	Prevent the increase in illegal deforestation and greenhouse gas emissions associated with deforestation, fires and slash-burning in the State of Roraima; periodically and systematically monitor forest carbon stocks in the State of Roraima; promote the control of deforestation through the integration of policies and actions aimed at territorial planning, land tenure regularization, environmental control, promotion of sustainable productive activities, economic incentives and institutional governance, to be carried out by differentgovernment agencies aiming at the construction of strategies and economic development based on the sustainable use of natural resources; promote pacts between the state government, municipalpublic managers and political and social leaders in priority municipalities, aiming at sustainable rural development through adherence to the PPCDQ/RR strategy; establish targets for reducing deforestation in the State of Roraima
State Plan Amazônia Agora - Pará 2020 - 2035 (PlanoEstadual Amazônia Agora - Pará. 2020 – 2035)	Raise Pará to the stage of State with Zero Net Emission (ELZ), or Carbon Neutral, in the “Land Use and Forests” sector, through both the sustained reduction of deforestation and the progressive annual increase in carbon removals from the expansion and/or recovery of forest areas, whose balance equals or exceeds the resulting sum between "authorized suppression" and "illegal deforestation

Laws and Regulations	Description/Objetive
Action Plan for the Prevention and Control of Deforestation and Slash-Burning in the State of Maranhão. 2011 - 2020 (Plano de Ação para Prevenção e Controle do Desmatamento e das Queimadas no Estado do Maranhão. 2011 – 2020)	Prevent and control deforestation, slash-burning and forest fires. Support structuring policies related to territorial and land managementin the State; Consolidate and strengthen the management of protectedareas in the State; Establish an environmental quality monitoringsystem in the State; Strengthen environmental management in theState, contemplating actions to improve licensing and decentralization of environmental management; Promote the prevention and control ofslash-burning in the State; Improve and increase the efficiency of environmental inspection in the State, including the fight against illegal deforestation; Regulate and establish a set of experiences in payment for environmental services, including the development of REDD projects and payment for water production; Contribute to promoting the recovery of hydrographic basins and degraded areas in the state territory; Strengthen and disseminate credit mechanisms for sustainable productive activities; Strengthen and expand the state technical assistance and rural extension system; Support the development of research to strengthen sustainable productive activities; Create instruments, promote and strengthen sustainable productive activities in the State, including development of certification mechanisms, and strengthening of productive activities in settlements,development of tourism in protected areas; Strengthen the bodies related to environmental management in the State; Establish an information management system for the Plan; Establish governance and transparency mechanisms for the Plan.
Plan for the Prevention and Control of Deforestation and Slash-Burning in the State of Tocantins (PPCDQ).2021 - 2025 (Plano de Prevenção e Controle do Desmatamento e Queimadas do Estado do Tocantins(PPCDQ). 2021 – 2025)	The general objective is to prevent, combat and monitor deforestationand forest fires throughout the territory of the State of Tocantins. Implement actions and methodologies to prevent forest fires and illegal deforestation; Strengthen and improve command and control aimed atcombating illegal deforestation and arson at the state level; Fight, in anagile and effective way, forest fires throughout the territory of Tocantins; Generate data, information and monitor its entire execution
National Policy on Climate Change (Política Nacionalsobre Mudança do Clima) Law No. 12,187/2009 and Decree No. 9,578/2018	Reduction of greenhouse gas emissions by 2020. Recognizes plans to combat deforestation as a means of achieving the goal.
Forest Code (Código Florestal)Law No. 12.651/2012 Law No. 12.727/2012	Establishes the protection of vegetation on private properties (APP, RL and restricted use areas) with the objective of preserving biodiversity, soil, water resources and the integrity of the climate system, for the well-being of present and future generations.

Laws and Regulations	Description/Objetive
Rural Environmental Registry (Cadastro AmbientalRural) (CAR) Law No. 12.651/2012 Law No. 12.727/2012 amends Law no. 12.651/2012Decree no. 7,830/2012 Decree no. 8,235/ 2014 Normative Instruction MMA no. 2/2014 Normative Instruction no. 3/2014 Decree no. 9,640/2018 Provisional Measure No. 884/2019Law No. 13,887/2019	Integrates environmental information of rural properties related to Permanent Preservation Areas-APP, Legal Reserves, forests and native forest remnants, restricted use areas and consolidated areas, becoming a database for control, monitoring, environmental and economic planning and combating deforestation. It integrates the environmental information of rural properties related to Permanent Preservation Areas - PPA, Legal Reserves, forests and native forest remnants, restricted use areas and consolidated areas, composing a database for control, monitoring, environmental and economic planning and combating deforestation. - Regulates Law 12,651 in relation to CAR and PRA - Establishes standards for Environmental Regularization Programs - Creates the CAR and National Rural Environmental Registry System-SICAR - Establishes SICAR's Information Integration and Security Policy - Regulates the Environmental Reserve Quota, established by art. 44of Law No. 12,651 of May 25, 2012 - Amends Law No. 12,651/2012, which provides for the protection ofnative vegetation and other measures - Amends Law No. 12,651/2012, which establishes that the CAR is mandatory and has no fixed term, with a deadline for adherence to the PRA for registered registrations until December 31, 2020.
National System of Nature Conservation Units (SNUC)(Sistema Nacional de Unidades de Conservação da Natureza (SNUC)) Law No. 9,985/2000; Law No. 11,516/2007 Decree No. 8,505/2015 Decree No. 10,140/2019 amends Decree No.8,505/2015	Contributes to preserving and restoring diversity in natural ecosystems, especially in Sustainable Development Units.
Amazon Protected Areas Program (Programa deÁreas Protegidas da Amazônia) (ARPA) ARPA Decree No. 8,505/2015 Decree No. 10,140/2019	Expands and strengthens the National System of Nature Conservation Units (SNUC) in the Amazon, Protect 60 million hectares and guarantee financial resources for themanagement of these areas in the short and long term and promote sustainable development in this region.
National Forest Program (Programa Nacional deFlorestas) (PNF) Decree No. 3,420/2000 Decreto No. 4,864 /2003 amends Decree No. 3,420 /2000)	Promotes sustainable development, balancing use with conservationof Brazilian forests.
National Biodiversity Policy (Política Nacional da Biodiversidade) Decree No. 4,339/2002	Promotes, in an integrated manner, the conservation of biodiversity and the sustainable use of its components, with the fair and equitablesharing of benefits derived from the use of genetic resources, components of the genetic heritage and traditional knowledge associated with these resources.
Amazon Fund (Fundo Amazônia)Decree No. 6,527/2008 Decree No. 8,773/2016	Created to raise funds for non-reimbursable investments in actions to prevent, monitor and combat deforestation and promote the conservation and sustainable use of the Legal Amazon.
Federal Program for Community and Family Forest Management – PMCF (Programa Federal de Manejo Florestal Comunitário e Familiar – PMCF) Decree No. 6,874/2009	Organize actions to promote sustainable management of forests thatare used by family farmers, agrarian reform settlers and traditional peoples and communities.

Laws and Regulations	Description/Objetive
National Policy for Territorial and Environmental Management of Indigenous Lands – PNGATI (Política Nacional de Gestão Territorial e Ambiental de Terras Indígenas – PNGATI) Decree No. 7,747/2012	Guarantees and promotes the protection, recovery, conservation and sustainable use of natural resources found in indigenous lands and territories, ensuring the integrity of indigenous heritage, increasing their quality of life and the full conditions of physical and cultural reproduction of current and future generations of indigenous peoples, respecting their sociocultural autonomy.
National Policy for Native Vegetation Recovery – Proveg (Política Nacional para Recuperação de Vegetação Nativa – Proveg) Decree No. 8,972/2017	Restores forests and other forms of native vegetation. It drives environmental regularization in Brazilian rural properties, in accordance with Law No. 12,651 of May 25, 2012, in a total area of at least 12 million hectares, by December 31, 2030. A relevant policyfor NDC, as it promotes the recovery of forests and other forms of native vegetation.
National Policy for the Sustainable Development of Traditional Peoples and Communities (Política Nacional de Desenvolvimento Sustentável dos Povos e Comunidades Tradicionais) Decree No. 6,040/2007	Promotes the sustainable development of Traditional Peoples and Communities, with a focus on recognizing, strengthening and guaranteeing their territorial, social, environmental, economic and cultural rights, respecting and valuing their identity, forms of organization and institutions.
Brazil's Nationally Determined Contribution to theParis Agreement (Contribuição Nacionalmente Determinada do Brasilpara o Acordo de Paris)	Reduction of greenhouse gas emissions by 37% by the year 2025 and43% by 2030 using as a basis the year 2005, under the terms of the National Policy on Climate Change (Law 12,187/2009), of the Law of Protection of Native Forests (Law 12,651/2012, henceforth known asthe Forest Code), the Law on the National System of Protected Areas (Law 9,985/2000), legislation, instruments and related planning processes.
Information Access Law (Lei de Acesso àInformação) Law No. 12,527/2011	Regulates access to information, as established in Item XXXIII of Article 5, Item II of Paragraph 3 of Article 37, and Paragraph 2 of Article 216 of the Federal Constitution; amends Law 8112, of December 11, 1990; revokes Law 11,111, of May 5, 2005, and provisions of Law 8,159, of January 8, 1991; and makes other arrangements.
Biodiversity Law (Lei da Biodiversidade)Law No. 13,123/2015	Establishes rules for accessing genetic heritage, accessing the corresponding traditional knowledge and sharing benefits. It sets the national definition of associated traditional knowledge, incorporating indigenous peoples, traditional communities and traditional farmers;also, the terms of access with the definition of parameters for prior and informed consent, and the fair and equitable sharing of benefits.Fundamental policy to protect and promote the rights and traditionalknowledge of these people that must be supported by the National Strategy for REDD+.
National Food and Nutrition Security System (SISAN) and the National Food and Nutrition Security Policy (PNSAN) (Sistema Nacional de Segurança Alimentar e Nutricional (SISAN) e a Política Nacional de Segurança Alimentar e Nutricional (PNSAN)) Decree No. 7,272/2010	Incorporates into State policy respect for food sovereignty and the guarantee of the human right to adequate food, with access to water of adequate quality and quantity as a guideline, in addition to providing and structuring sustainable and decentralized systems, based on agroecological, production, extraction, food processing anddistribution, promoting them in the scope of international negotiation and cooperation.
National Policy on Agroecology and Organic Production (PNAPO) (Política Nacional de Agroecologia e Produção Orgânica (PNAPO)) Decree No. 7,794/2012 with amendments by Decree No. 9,784/2019)	Integrates, mobilizes and adapts policies, programs and actions that lead to the agroecological transition and organic and agroecological production, contributing to the sustainable development and qualityof life of the population, through the sustainable use of natural resources and the supply and consumption of healthy foods.
Quilombola Social Agenda under the Brazil Quilombola Program (Agenda Social Quilombola no âmbito do Programa Brasil Quilombola) Decree No. 6,261/2007	Promotes the improvement of living conditions and expands access to public goods and services for people living in quilombola communities in Brazil.

Laws and Regulations	Description/Objetive
Brazilian Biodiversity Information System (SiBBr)(Sistema de Informação sobre Biodiversidade Brasileira (SiBBr))	Integrates data and information on Brazilian biodiversity to support: i) scientific production, II) formulation of public policies and decision-making processes. SiBBr supports actions for environmental conservation and sustainable use of natural resources.
National Plan for the Promotion of the Sociobiodiversity Production Chain (Plano Nacional para a Promoção da Cadeia de Produção da Sociobiodiversidade)	Promotes the conservation, management and sustainable use of socio-biodiversity products; strengthens the production chains in each of the biomes, adding value to socio-biodiversity products; it strengthens the social and productive organization of indigenous peoples, quilombola populations, traditional communities and family farmers; expands, strengthens and mobilizes economic instruments necessary for structuring production chains.
National Plan for Strengthening Extractivist and Riverine Communities (Planafe) (Plano Nacional de Fortalecimento das Comunidades Extrativistas e Ribeirinhas (Planafe))	Guarantees the quality of life, access and sustainable use of natural resources, environmental conservation and the promotion of human rights for extractivist and riverine communities.
National School Food Program (PNAE) (ProgramaNacional de Alimentação Escolar (PNAE))	Encourages the purchase of food directly from family farmers, prioritizing land reform settlements, indigenous peoples and traditional peoples and communities, favoring ways of life associated with forests and natural ecosystems.
Food Acquisition Program (PAA) (Programa deAquisição de Alimentos (PAA)) Law No. 12,512/2011	Encourage family farming through sustainable production, production processing and income generation; to promote and value biodiversity and the production of organic and agroecological food; promote access to quality food, from the perspective of human rights to adequate and healthy food; strengthen local and regional circuits and networks of commerce, stocks and food supply through government contracts; encourage cooperatives and associations.
National Biodiversity Monitoring Program (Programa Nacional de Monitoramento da Biodiversidade)	Monitor biodiversity in protected areas. I. Generate qualified information to support the management ofprotected areas; II. Establish ecological parameters to assess the effectiveness offederal UCs; III. Provide subsidies for the assessment of the conservation status ofBrazilian fauna and flora and for the implementation of conservation strategies for endangered species and control of invasive aliens; IV. Subsidize, evaluate and monitor in situ projections of changes in the distribution and places of occurrence of species in response to climatechange and other pressure and threat vectors.
Project for Monitoring the Deforestation of the Brazilian Amazon Forest by Satellite (PRODES) (Projeto de Monitoramento do Desmatamento da Floresta Amazônica Brasileira por Satélite (PRODES))	Satellite monitoring of clear-cut deforestation in the Legal Amazon.
Real-Time Deforestation Detection System (DETER) (Sistema de Detecção de Desmatamento em Tempo Real (DETER))	Conducts a rapid survey of evidence alerts on changes in forest coverin the Amazon.
Forest Fire and Slash-Burning Monitoring Program (Programa de Monitoramento de Incêndios e Queimadas Florestais)	Monitors fires and forest slash-burning detected by satellites,calculates and predicts the risk of slash-burning of vegetation.

Laws and Regulations	Description/Objetive
Land Cover Use Mapping of Deforested Areas in the Amazon – TerraClass (Mapeamento do Uso Cobertura da Terra de Áreas Desmatadas da Amazônia - TerraClass)	Map the use and coverage of deforested areas in the Brazilian Legal Amazon to understand the dynamics of land use and coverage in theBrazilian Legal Amazon.
Strategy of the Environmental Monitoring Program for Brazilian Biomes (PMABB) (Estratégia do Programa de Monitoramento Ambiental dos Biomas Brasileiros (PMABB)) Ordinance MMA No. 365/2015	Map and monitor deforestation, including its rate; assess vegetationcover and land use; monitor forest fires; and restoring vegetation andselective extractivism.
National Forest Inventory (Inventário FlorestalNacional)	Conduct a systematic survey of Brazilian forest resources.
Emission Records System - SIRENE (Sistema deRegistros de Emissões – SIRENE)	Regularly update greenhouse gas emission estimates from a range ofsectors, including land-use change and forestry, and assess the evolution of the GHG emissions profile, supporting the monitoring of compliance with Brazil's commitment to reduce its emissions.

2.2 International Protocols and Agrrements

The relevant international policy and legal framework for Brazil's REDD+ efforts are listed in Table 2-2.

Table 2-2. Institutional frameworks at the International level.

International Policies/Legislation	Description/Objective
United Nations Framework Convention on ClimateChange (UNFCCC).	Stabilize greenhouse gas concentrations in the atmosphere at a level that wouldprevent dangerous anthropogenic interference with the climate system.
Paris Agreement, as well as the decisions taken atthe respective Conferences of the Parties.	
United Nations Convention on Biological Diversity(UNCBD), as well as the decisions taken at the respective Conference of the Parties, notably at COP11/2012, held in Hyderabad, India, Decision IX/19, which established the Biodiversity Safeguards in accordance with the REDD+ approach.	Promote the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits derived from the useof genetic resources, ensuring the free, prior and informed consent of States, as well as the protection and promotion of associated traditional knowledge.
Ramsar Convention on Wetlands of International Importance.	Promotes the conservation and rational use of wetlands, such as the Baixada Maranhense, the Pantanal in the state of Mato Grosso, the Atol das Rocas, etc.
FAO International Treaty on Plant Genetic Resources for Food and Agriculture	Promote the conservation and sustainable use of plant genetic resources for food and agriculture, and the fair and equitable sharing of benefits arising fromtheir use, in line with the Convention on Biological Diversity. Establishes the right of farmers to conserve, use, exchange and sell on-farm conserved seeds and other propagation material retained by farmers; protect their traditional knowledge and participate in decision-making on the fair and equitable sharingof benefits arising from the use of plant genetic resources for food and agriculture.

International Policies/Legislation	Description/Objective
ILO Convention on Indigenous and Tribal Peoples169.	Applies to indigenous peoples and traditional peoples and communities, to promote the full realization of the social, economic and cultural rights of these peoples, respecting their social and cultural identity, their customs andtraditions, and their institutions. Recognizes the ownership and possession rights of the territories they occupy or have already used for their traditional and livelihood activities; the right to participate in the use, management and conservation of natural resources; as well as the right to free, prior and informed consultation, in accordance with its own institutions, among other rights.
United Nations Declaration on the Rights of Indigenous Peoples.	Reflects the set of claims of indigenous peoples to improve their relations with national states and is used to set minimum standards for other international instruments and national laws. The declaration includes principles such as equalrights and the prohibition of discrimination, the right to self-determination and the need to obtain consent and agreement as a reference for the relationshipbetween indigenous peoples and the States.
International Covenant on Economic, Social andCultural Rights.	Economic, social and cultural rights for individuals, including labor rights and theright to health, as well as the right to education and an adequate standard of living.
International Covenant on Civil and PoliticalRights.	Civil and political rights of individuals.
International Convention on the Elimination of AllForms of Racial Discrimination.	Eliminating Racial Discrimination and Promoting Understanding Between AllRaces.
Convention on the Children's Rights.	Children's Rights
Convention on the Protection and Promotion of the Diversity of Cultural Expressions.	Protection and promotion of the diversity of cultural expressions
Convention on the Elimination of Discriminationagainst Women.	Women's rights
Convention for the Safeguards of Intangible Cultural Heritage.	Safeguarding and ensuring respect for tangible cultural heritage
Convention Relating to the Protection of theNatural and Cultural Heritage of the World.	Protection of the World Cultural and Natural Heritage
American Convention on Human Rights.	Human Rights
American Declaration on the Rights and Duties ofMan.	Human Rights
American Declaration on the Rights of Indigenous Peoples.	Indigenous Peoples Rights
Universal Declaration of Human Rights.	Human rights

2.3 Environmmental Impact Assessment in brasil

Environmental Impact Assessments (EIA) are part of the environmental licensing process and represent one of the greatest environmental management tools in Brazil. They are mandatory for all activities potentially causing a significant environmental impact, although the regulation is ambiguous as to the definition of these activities. The EIA process includes both the development of an environmental impact report and public hearings, which are organized only if deemed necessary by the environmental agency, if requested by the Public Ministry or by more than 50 citizens. At hearings, a summary in non-technical language is required to provide information about the EIA process. The process also requires that various government authorities be consulted, including

ANVISA and various institutions related to cultural heritage, or traditional or indigenous communities.

EIA was introduced at the federal level by the PNMA Law in 1981 and later recognized in the Federal Constitution and CONAMA Resolution 01/1986-1997, which established the minimum scope of EIA. The responsibility for the environmental licensing process, which includes the EIA, was divided into three government levels by Complementary Law 140/2011 and subsequent decree of the Presidency of the Republic.The responsible entity depends on the objective, scale, location and extent of the project's potential environmental impact.

At the state level, most agencies have their own requirements depending on the type of activity and project. For territorial planning or other development programs and projects it is important to note that environmental assessments are not legally required at the federal level. However, it is mandatory in some states to carry out an economic-ecological zoning (ZEE), an instrument for managing the use of rural territory that was introduced in 2002 and covers the entire Amazon biome[1].

2.4 UNDP Environmental and Social Screening Procedure

The environmental and social implications of the Floresta+ Pilot Project were tested through the application of the UNDP's Environmental and Social Screening Procedure (SESP).[2]

This screening process determined that the Floresta+ Pilot Project includes activities with potential adverse social and environmental risks and impacts that are more varied or complex than those of moderate risk projects but remain limited in scale and are of lesser magnitude than those of high-risk projects. Following UNDP specifications, the significance of each risk was rated on a 4-level scale: Low, Moderate, Substantial and High.

The risk assessment developed at the ESMF (IDAD, 2021) represents, in practice, a careful scoping process, which typically must precede the assessment of environmental and social impacts.

Scoping is the process of identifying and prioritizing the key issues associated with a project and identifying the extent to which each of the issues will be investigated in the subsequent impact assessment (IAIA, 2018). Scope definition is important because it leads to further studies focusing more deeply on the potentially significant impacts of a proposed project and not getting lost in matters of lesser relevance.

Scope definition focuses the impact assessment on issues that must be considered by the decision maker when deliberating whether or not to approve a project and determines what conditions to apply.

The screening procedure identified 10 distinct risks (5 moderate e 5 substantial. Overall, the project risk was qualified as Substantial.

[1] PNIA 2012: National Panel of Environmental Indicators. Theoretical framework, composition and synthesis of indicators

[2] Given that a new version of the UNDP SES/SESP was launched just before the ESIA was initiated, though not required for use by the project according to UNDP policy during the one- year transition phase, the ESIA consultants took the opportunity to use the SES/SESP/2021 version to update the ESMF (which had been based on the SES/SESP/2015). Following the results of the ESIA, a recommendation will be made with regard to the appropriate risk categorization for the project.

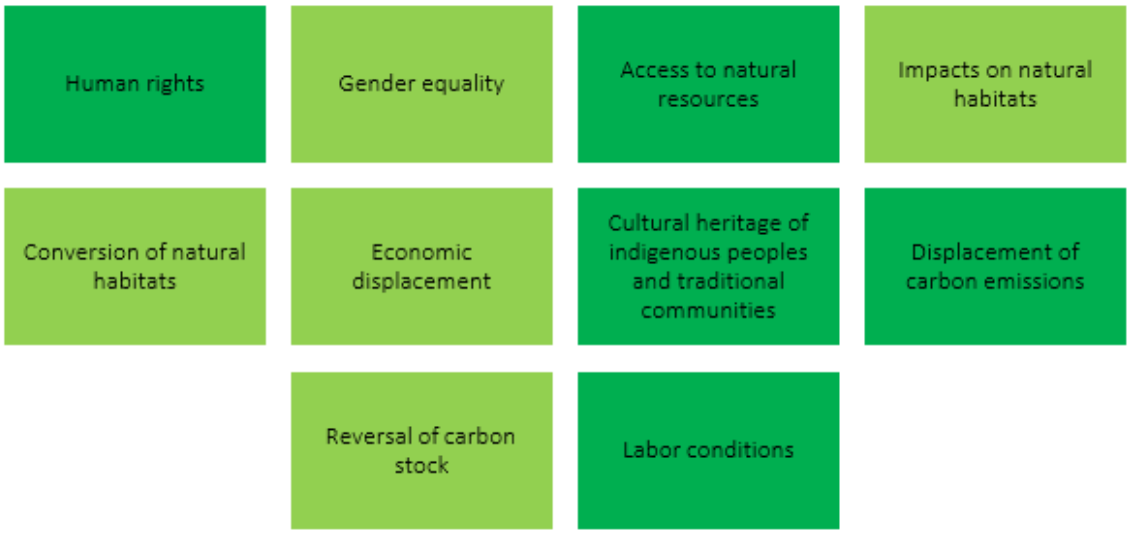


Figure 2-1 Environmental and social risks identified in the ESMF (IDAD, 2021).

The ten risks, described in detail in the Environmental and Social Management Framework (ESMF) are as follows (see Figure 2-1) (IDAD, 2021):

Risk 1: adverse impacts on the enjoyment of HUMAN RIGHTS of affected populations through unfair or discriminatory impacts and exclusion, particularly of indigenous peoples and traditional communities, marginalized groups or people living in poverty. There are potential risks of exclusion of marginalized groups associated with the proposed beneficiary selection mechanism, which uses the Rural Environmental Registry (CAR) as the main entry point into the program. There is a risk of unfair distribution of benefits when payments and compensation amounts are adjusted and directed towards deforestation "hotspots" in large tracts of intact forest. There is a risk of not fully respecting the rights of indigenous peoples and affecting their lands, territories, resources, traditional livelihoods and cultural heritage.

- Significance of risk was rated as Substantial
- .

Risk 2: Adverse impacts on GENDER equality and/or the status of women and girls. The project can potentially reproduce gender-based discrimination against women, especially in relation to participation in design and implementation or access to opportunities and benefits. The project may limit women's ability to use, develop and protect natural resources, considering the different roles and positions of women and men in accessing the benefits.

- Significance of risk was rated as Moderate.

Risk 3: LOSS OF ACCESS TO NATURAL RESOURCES, especially land and non-timber forest products. Project activities can create tensions or exacerbate conflicts between communities and individuals over land use and property rights claims. In some cases, the program can generate land speculation and lead to land grabbing, conflicts and violations, with clear damage to the rights of traditional peoples and communities. The Project could potentially restrict the availability, quality and access to resources, especially for marginalized groups, with respect to agriculture, grazing, hunting or gathering forest products.

- Significance of risk was rated as Substantial.

Risk 4: Project activities may have indirect negative impacts on NATURAL HABITATS OR PROTECTED AREAS.

- Significance of risk was rated as Moderate.

Risk 5: Project activities may trigger the DEGRADATION OF NATURAL HABITATS OR ECOSYSTEMS.

- Significance of risk was rated as Moderate..

Risk 6: Risk of ECONOMIC DISPLACEMENT and inadequate compensation.

- Significance of risk was rated as Moderate.

Risk 7: The project may potentially adversely affect the CULTURAL HERITAGE OF INDIGENOUS PEOPLES as well as TRADITIONAL PEOPLES AND COMMUNITIES in its intangible form, including knowledge, practices, technologies, innovations and institutions related to traditional ways of life.

- Significance of risk was rated as Substantial.

Risk 8: DISPLACEMENT OF CARBON EMISSIONS to other sectors, biomes or neighboring countries.

- Significance of risk was rated as Moderate.

Risk 9: REVERSALS (non-permanence of carbon stocks). As with all REDD+ projects, there is a risk of reversals including in conservation, sustainable management of forests and increase in carbon stocks. These risks are related to factors that could result in the participant's withdrawal from the volunteer program.

- Significance of risk was rated as Moderate.

Risk 10: The project could potentially reproduce EXPLOITING LABOR CONDITIONS related to situations of vulnerability in the workplace, forced labor or child labor

- Significance of risk was rated as Substantial.

The screening procedure concluded that the Floresta+ project must undergo an Environmental and Social Impact Assessment (ESIA) focused and adequate for the purpose. It is intended to analyse the range and interactions of potential risks and impacts to better guide the establishment of criteria for the selection of priority areas to avoid or mitigate negative impacts. An Environmental and Social Management Plan (ESMP) and associated management plans will complement the ESIA.

3. DESCRIPTION OF THE FLORESTA+ PILOT PROJECT

3.1 PAYMENT FOR ENVIRONMENTAL SERVICES

Payments for Environmental Services (PES), the focus of the Floresta+ Pilot Project, provide incentives directly to forest owners and users to manage forests better and deforest less. In principle, the PES will compensate those who find forest conservation more profitable than other economic alternatives. In a seminal text on the Amazon, Bertha Becker (2005) writes: "The forest will only cease to be destroyed if it has economic value to compete" with other economic sectors operating in the territory.

Payments for Environmental Services can be defined as voluntary transactions between users and service providers that are conditional on previously agreed rules and that aim to manage natural resources for the generation of external services (Wunder 2015). Other authors (Muradian et al., 2010) suggest that PES are a "resource transfer between social actors, which aims to create incentives to align individual and/or collective land use decisions with the social interest in the management of natural resources."

Law No. 14,119/2021 which instituted the National Policy on Payment for Environmental Services ("PNPSA") was published on January 14, 2021. There PES is defined as a "voluntary transaction, by which a payer for services environmental transfers to a provider of these services financial resources or other form of remuneration, under the agreed conditions, respecting the relevant legal and regulatory provisions". This Law lists several PES Modalities: (i) direct payment, monetary or non-monetary; (ii) provision of social improvements to rural and urban communities; (iii) compensation linked to a certificate for reducing emissions from deforestation and degradation; (iv) green bonds; (v) commodate; and (vi) Environmental Reserve Quota ("CRA").

Given the complexity of the issue, the International Union for the Conservation of Nature (IUCN) chose to define Payments for Environmental Services on the negative side. Thus, payment for environmental services (IUCN, 2012) is not:

- "a gift for sitting and doing nothing;
- a government award for being located in forested areas;
- the outcome of a global mandate;
- a subsidy from the state, with nothing done in return;
- a bureaucracy created by the federal government."

Assessing the efficiency of a Payments for Environmental Services system raises some difficulties. When someone decides to pay back economically for an environmental service, it is essential to be sure that they will receive what they paid for. Since the ecosystem service is provided over time, it is necessary to consider what would hypothetically happen without the payment for ecosystem services scheme, ie it is necessary to build some counterfactual baselines (Wunder, 2005) The first and main question to ask is whether the PES scheme has a sufficiently large additional effect over this baseline: whether the PES actually made a difference. Hence the concept of additionality.

The guarantee of additionality presupposes three design and implementation factors (Wunder et al. 2018):

- Participation aimed at high environmental service and high risk areas;
- Cost-effective payments (in line with supplier opportunity costs); and
- Non-compliance is effectively monitored and sanctioned.

On the other hand, if a PES scheme finances reforestation in a certain area, but this directly causes deforestation pressures in a neighboring area, then the PES scheme had a high loss (leakage): it achieved high additionality only for the area of the project, but not to the broader global goal. If after the end of the scheme all the reforested trees are cut down immediately, the permanence of the scheme will be less than if the trees were

left standing. Loss and permanence are two other concepts to consider when evaluating the effectiveness of PES schemes.

Another defining feature of the PES is conditionality: the quid pro quo principle of reducing or stopping payments when environmental services are not adequately provided (Wunder at al., 2020).

In summary, in REDD+ terminology, the possibility of payments from some actors (donors) causes other actors (forest owners and users) to change their behavior: this results in better forest management and/or less deforestation, leading to reduced emissions of CO2 from deforestation and forest degradation and/or maintenance, and even from increased carbon stocks; ultimately, REDD+ mitigates climate change.

Some confusion can arise if the REDD+ result (emissions) is not clearly differentiated from the REDD+ framework that allowed these same results to be achieved (Martius et al. 2018). Additional confusion can arise if the process of raising funding from donors is not distinguished from the later application of these same funds.

Brazil received USD 96 million from the Green Climate Fund (GCF) for REDD+ results achieved in 2014 and 2015 in the Amazon. Investments made with GCF pay-for-results funds should be reinvested in the implementation of national REDD+ policies that will contribute to the implementation of the NDC[3]. However, there is no obligation to generate new emission reductions with the financial resources received from past results.

In the case under evaluation, the application of resources will be made through a Pilot Project for Payment for Environmental Services, the Floresta+ Amazônia project. It is important to clearly repeat that Floresta+ Amazônia does not have to generate new emissions reduction results or REDD+ results. Still, UNFCCC decisions indicate that the Cancun safeguards apply as much to actions and policies that generate REDD+ results as to the use of resources received through payments for results.

The Floresta+ Pilot Project is a consequence of the REDD+ policy in Brazil. Its focus is on Payment for Environmental Services. Thus, the focus of the Environmental and Social Impact Assessment, and the consequent Environmental and Social Management Plan, of the Floresta+ Pilot Project will be on the payment for environmental services: in the governance processes, in the direct and indirect risks and benefits of these payments.

3.2 The Floresta+ amazônia Pilot Project

Results-based payments received by Brazil from the GCF will contribute to the implementation of Brazil's NDC. This project proposal has two main results:

- Development of a pilot for an Environmental Services Incentive Program for the Conservation and Recovery of Native Vegetation (Floresta+); and
- Strengthen the implementation of ENREDD+ from Brazil through improvements in its structure and governance systems.

These two results will contribute to the achievement of the overall objectives of the country's ENREDD+ and NDC. Additional details are provided below.

Result 1: **Floresta+ Amazônia Pilot Project**

[3] NDC - Nationally Determined Contribution to the Paris Agreement

The beginning of the implementation of Floresta+ will be used to promote broad stakeholder consultations and develop this social and environmental impact assessment. It is intended to establish detailed operational safeguards management plans and inform the broader Floresta+ project. This includes the selection of beneficiaries in Modalities 1, 2, 3 and 4 (as described in more detail in the Summary of Activities section below). It will also include:

- the establishment and operation of a governance structure;
- the definition of values and priority areas for direct payments;
- updating of the National System of Rural Environmental Registration (SICAR) for registration andmonitoring of processes;
- the development of a simplified online platform for registering direct payment proposals;
- the process of selecting beneficiaries and projects;
- and the establishment of contracts.

Direct payments to each family of rural farmers who voluntarily participate in Modalities 1 and 2 will be made up to a maximum of four years during the project, considering the period between admission and completion of the project. Thereafter, annual payments will be based on the results of monitoring the conservation and recovery of native vegetation.

The duration of the projects in Modalities 3 and 4 will be determined in the specific criteria and guidelines for each target beneficiary group, both for indigenous peoples and for traditional communities for Modality 3, as well as for public and private institutions or agencies, civil associations, cooperatives and private law foundations in Modality 4.

Result 2: The implementation of ENREDD+ Brazil

The activities of this output will follow the calendar established in ENREDD+ and CONAREDD+ (National REDD+ Commission). Activities are ongoing and the project will support the improvement of related products and processes. The initial focus is to support the preparation of the national FREL[4] and improve the implementation of the SISREDD+ (REDD+ Safeguards Information System), including exploring synergies with the UNDP Complaints Resolution Mechanism and social and environmental safeguards requirements. Then, the Public Policy Matrix and the review of the National REDD+ Strategy will be carried out, considering the NDC in Brazil. Expanding the capacities and access of different actors to participate in CONAREDD+ and its Technical Working Groups and in cooperation initiatives with other countries are cross-cutting themes and will be implemented during the project.

Floresta+ is a new and innovative Pilot Project that aims to provide Incentives for Environmental Services in the Legal Amazon region, in accordance with the Forest Law of Brazil and ENREDD+. This Pilot Project will have the following specific objectives:

- Provide monetary compensation for environmental services performed that result in improvement, conservation or restoration;
- Prevent the occurrence of deforestation, forest degradation and forest fires through financial incentives;
- Encourage the conservation and recovery of native vegetation on rural properties, conservation areas, indigenous lands, settlements and lands belonging to communities and traditional peoples;
- Promote compliance with environmental legislation (mainly the Forest Law), especially those related to the protection and recovery of native vegetation;

[4] FREL – Forest Reference Emission Level.

- Offer a financial mechanism to promote the development and implementation of public policies aimed at the conservation and recovery of native vegetation.

The target beneficiaries of the Floresta+ Pilot Project are composed of:

- Family farmers, defined in accordance with art. 3, V, of the Forestry Law (Law No. 12,651/2012), and art. 3 of the National Policy on Family Agriculture and Rural Family Enterprises (Law No. 11,326/2006);
- Indigenous Peoples;
- Traditional peoples and communities, defined in accordance with I of art. 3, of Decree No. 6,040/2007 i.e.:
    - culturally differentiated groups that recognize themselves as such, that have their own forms of social organization, that occupy and use territories and natural resources as a condition for their cultural, social, religious, ancestral and economic reproduction, using knowledge, innovations and practices generated and transmitted by tradition
- And Public institutions or bodies (including States and Municipalities), civil associations, cooperatives and foundations under private law that work on issues related to the conservation and restoration/recovery of native vegetation.

The prioritization of areas to be selected as beneficiaries of the Floresta+ pilot program will consider:

a) Regions with high rates of deforestation, forest degradation and forest fires;

b) Priority areas for the conservation of biodiversity and for the recovery of native vegetation, inaccordance with the norms defined by the MMA;

c) Buffer zones around protected areas;

d) Regions with greater density of small producers;

e) Regions with the greatest concentration of traditional peoples and communities;

f) Integration with other public policies related to conservation and restoration/recovery of nativevegetation.

The Floresta+ Pilot Project will encourage the conservation and recovery of native vegetation in accordance with the Forest Law of Brazil and PROVEG (National Policy for the Recovery of Native Vegetation - Federal Decree No. 8972/2017). This will contribute to reducing pressure on native forests, revealing consistency with ongoing efforts to eliminate illegal deforestation and promote ecosystem restoration/recovery, which are part of the overall objective of ENREDD+ in Brazil.

The Floresta+ Pilot Project will work through four Modalities of resource distribution:

1. Modality 1 (Forest + Conservation): incentives for owners and squatters of rural properties in accordancewith the classification of item V, of the Forest Code Article (Law nº 12,651/2012), with the objective ofconserving remnants of native vegetation additional to legal requirements up to 380,000 hectares;
2. Modality 2 (Forest + Recovery): incentives for owners and squatters of rural properties according to theclassification of item V, of the Forest Code Article (Law nº 12,651/2012), with the objective of recovering Permanent Preservation Areas up to 180,000 hectares (e.g. riparian forests, mountain tops and steep slopes);
3. Modality 3 (Forest + Communities): support for up to 64 projects for associations and entities representing indigenous peoples and traditional peoples and communities;

4. Modality 4 (Forest + Innovation): support up to 20 innovative actions and measures to develop, implement and leverage public policies for the conservation and restoration/recovery of native vegetation.

The project will start during 2021 and will have a maximum intensity between 2022 and 2023 as shown in Table 3-1.

Table 3-1. Evolution of the goals of the various Modalities between 2021 and 2024.

	Global goal	Goal per period			
		2021	2022	2023	2024
Modality 1: Forest area supported by incentives to environmental conservation services [hectares]	380,000	20,000	80,000	200,000	80,000
Modality 2: Area supported by incentives for environmental restoration/recovery services [hectares]	180,000	5,000	30,000	80,000	65,000
Modality 3: Projects to support indigenous peoplesand traditional peoples and communities	64	10	30	20	4
Modality 4: Projects to support the improvementand adoption of innovative instruments for publicpolicies related to the preservation and restoration/recovery of forests	20	5	5	5	5

The total fund available for the Floresta+ Pilot Project is 421 million Reais[5] with the distribution by Modality shown in Figure 3-1.

[5] Exchange rate on 03/31/2021: R$/US$ 5.65 (Central Bank of Brazil).

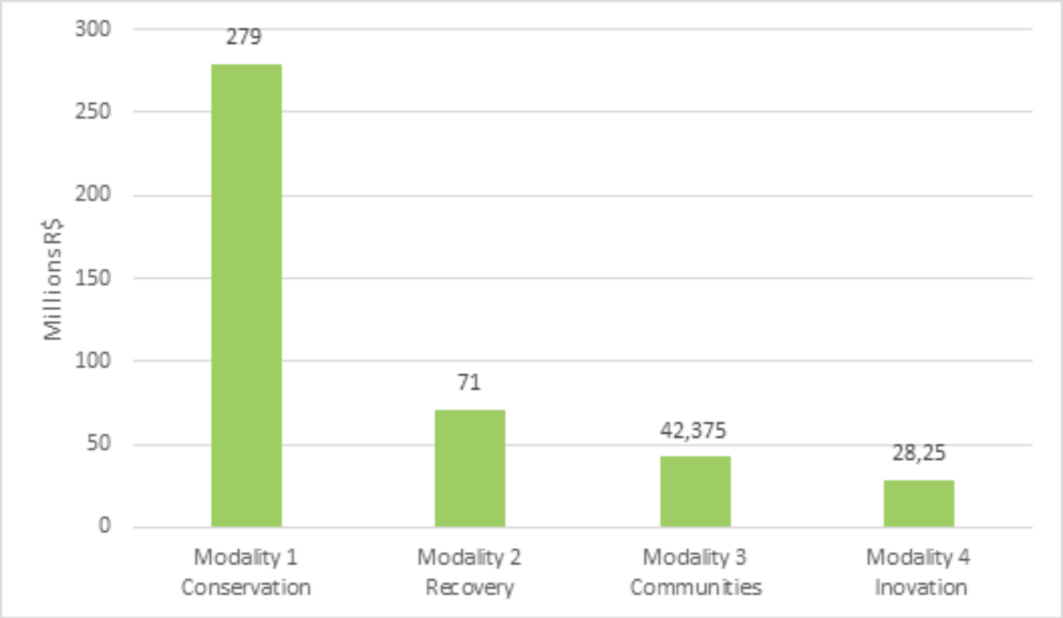


Figure 3-1 Distribution of financing by Modalities.

The detailed description of the Modalities can be found in the Project Operation Manual. The current version of the MOP can be found at the following link:

https://www.br.undp.org/content/brazil/pt/home/projects/projeto-piloto-floresta--amazonia1.html.

The MOP includes for each of the Modalities the following items:

- Main characteristics of the modality
- Implementation logic
- Eligibility criteria
- Criteria for prioritizing specific regions and beneficiary groups
- Incentive Structure
- Incentive transfer mechanism
- Dissemination and call
- Process for qualifying, verifying and selecting beneficiaries
- Obligations of beneficiaries or responsible parties
- Financial and performance monitoring

The Project Management Unit (PMU) will be structured on three levels (see Figure 3-2) and will contain approximately 40 people. The coordination team will include seven people responsible for cross-cutting themes: project coordinator, two project assistants and two technical analysts, a technical advisor dedicated to safeguards and, finally, a technical analyst responsible for communication. Whenever necessary, it will be possible to use a roster of consultants for more specialized studies.

On a second level, the operational team for the management of the Modalities will appear, which will include a total of five people. Finally, there will be nine state teams totaling 28 people.

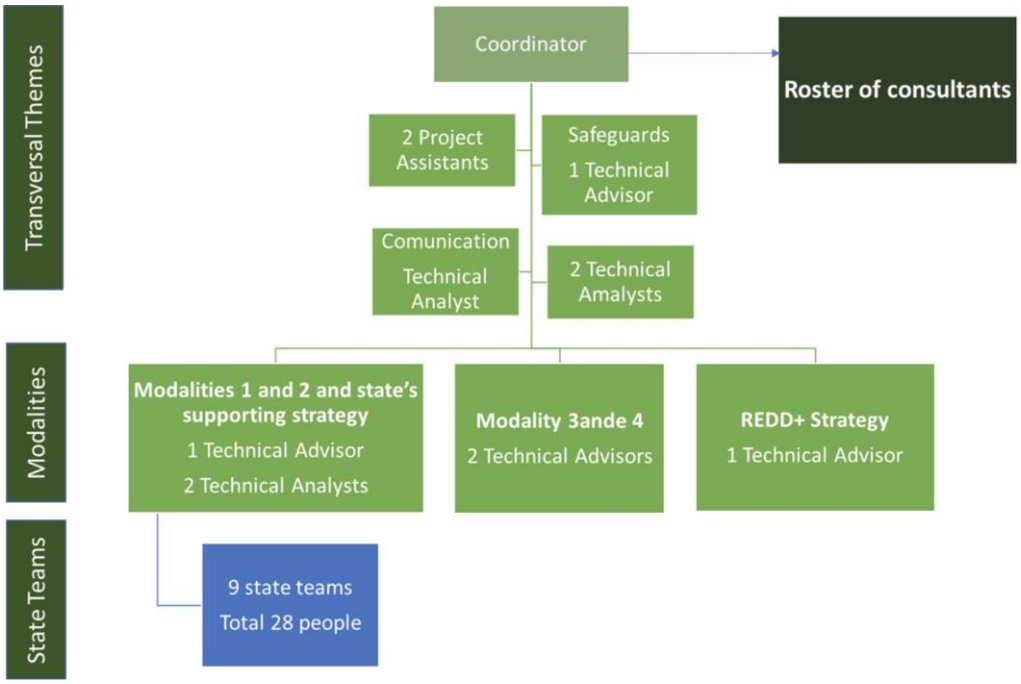


Figure 3-2. Management structure of the Floresta+ Amazônia Pilot Project.

4. ASSESSMENT METODOLOGY

4.1 CONCEPTUAL ASSESSMENT MODEL

The identification of risks associated with the implementation and operationalization of the Floresta+ Pilot Project presented in the previous topic resulted fundamentally from an expert analysis, supported by an in-depth knowledge of the applicable institutional and legal framework. In a later phase of the study, the risks will be assessed through dialogue with stakeholders.

In order to ensure a strong focus on decision-making issues rather than a vague set of environmental issues, it is essential to integrate the relevant biophysical, social, institutional and economic issues, keeping the strategic focus on a few, but critical, issues.

The identification of assessment dimensions, also called critical decision factors, must be done through a synthesis effort so that they are few, but holistic, integrated and focused. Partidário (2012) recommends that these dimensions be between three and five to ensure a strategic focus and should never exceed seven. The evaluation dimensions must be easy to communicate, be expressed by simple and easily understood keywords, sufficient to express their integrated meaning.

Based on these principles of good methodological practices and specific knowledge of the potential impacts of the Floresta+ Pilot Project, the result of a detailed analysis of its risks and benefits, the ESIA was structured in five dimensions of analysis, namely:

1. Transversal Rights
2. Territories and Cultures
3. Livelihood
4. Biodiversity
5. Climate Change

The risks pre-identified in the ESMF will be grouped as shown in Figure 4-1. During the first phases of the ESIA's development, the opportunity to integrate in these five analytical dimensions other themes that may be considered as critical may be concluded. As a possible example, the possible need to incorporate climate change adaptation into the "Climate Change" dimension should be mentioned.

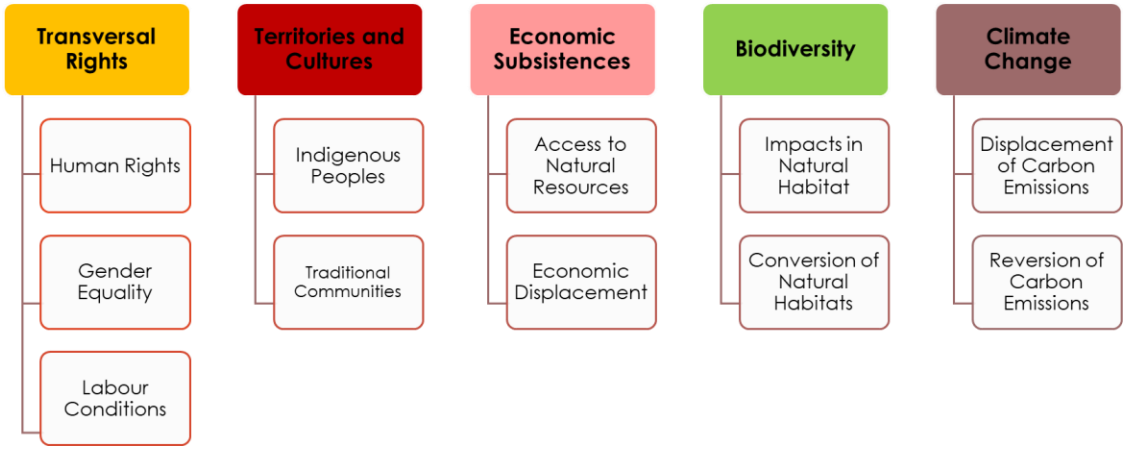


Figure 4-1. Dimensions of assessment.

It is intended with this methodological approach to reach a conceptual model that helps a socio-ecological reading. The IAIA – International Association for Impact Assessment has published a reflection paper on how Impact Assessment can contribute to creating links between people's well-being and biodiversity (IAIA, 2021). Consideration of these links is important because:

1. "The direct, indirect, induced and cumulative impacts on ecosystems and biodiversity, pollution, habitat destruction resulting from the unsustainable use of resources and climate change affect people's livelihoods, health, safety, food and water security, well-being and human rights.
2. Explicit consideration of the values of affected parties, their rights, the levels of dependence on ecosystems and biodiversity, and the willingness to accept alternatives or substitute projects is essential in the Impact Assessment."
3. A socio-ecological approach, with clearly defined objectives for biodiversity and people, can provide a common framework to guide project development. It will also encourage collaboration and synergies between experts.
4. It is critical to develop integrated livelihoods and biodiversity plans, with sufficient time and duration to ensure sustainability of outcomes for people and biodiversity, and contingencies in place to deal with unanticipated outcomes.
5. To achieve effective implementation and stakeholder accountability it is essential to make tangible commitments to adaptive and corrective management to achieve explicit results, independent monitoring and auditing of biodiversity and ecosystem services in support of well-being and the means of people's livelihood."

The IAIA (2021) concluded that designing a comprehensive socio-ecological baseline, including stakeholder engagement and assessing the rights and values of vulnerable groups early in planning, is essential to understanding:

a) "How men, women, youth and different community groups in the area of influence of a given project, in areas affected by resettlement, involuntary displacement of people or internal migration and society in a broader context, use, depend on and benefit from biodiversity.

b) the resilience thresholds to sustain biodiversity and ecosystem services, livelihoods, human rights and the rights of nature.

The five dimensions of evaluation proposed above are interconnected, have functional relationships with each other, and even have some overlaps. Figure 4-2 outlines a simple socio-ecological model which could serve as a conceptual basis to avoid methodological compartmentalization of the ESIA and subsequent ESMP.

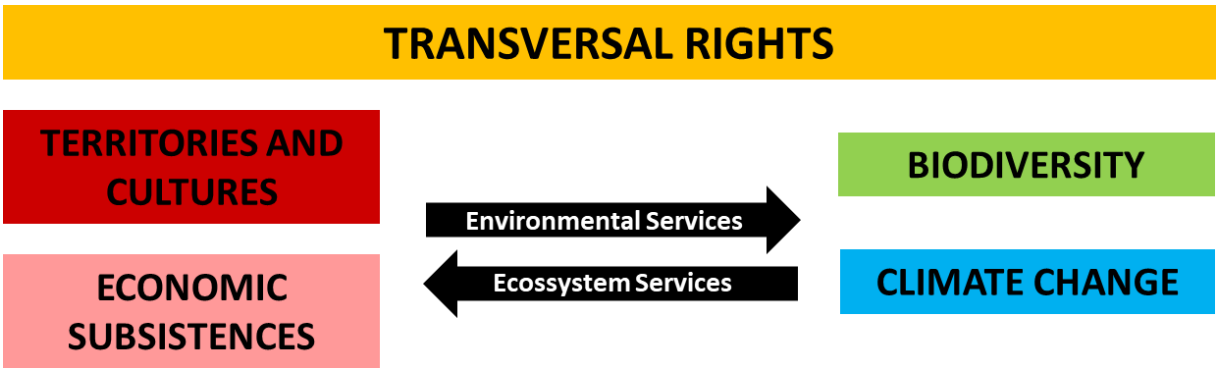


Figure 4-2. Conceptual socio-ecological impact assessment model (based on IAIA (2021)).

The conceptual model distinguishes the mostly social analytical dimensions on the left side and the environmental or ecological components on the right side. Considering the objective of the study, environmental services, as well as ecosystem services, are a central part of the conceptual model and establish explicit relationships between the social and environmental components of the model. In this model, transversal rights should be interpreted as a big hat with a broader scope that cuts across the various analytical dimensions. As mentioned above, the intention of the conceptual model is to avoid compartmentalization between the various dimensions of analysis: although not portrayed, there are functional relationships between all dimensions.

4.2 Impact classification

The initial impact classification approach developed by the consulting team followed the most orthodox impact assessment principles: a distinction between positive and negative impacts and their grading on a scale of significance. The initial intention was to articulate the qualification of impacts with the significance levels (see Table 4-1) according to the guidelines of the UNDP Environmental and Social Screening Procedures (SESP) (2021).

Table 4-1. Impact significance levels included in the UNDP Environmental and Social Screening Procedures (SESP) (2021).

Level	Qualification	Description
5	Extreme	Significant adverse impacts on human populations and/or the environment. Adverse impacts of large scale magnitude and/or spatial extent (e.g. large geographic area, large number of people, transboundary impacts, cumulative impacts) and duration (eg long term, permanent and/or irreversible); areas adversely affected include areas of high value and sensitivity (eg valuable ecosystems, critical habitats); adverse impacts on the rights, lands, resources and territories of indigenous peoples; involve significant levels of displacement or resettlement; generate significant amounts of greenhouse gas emissions; impacts can give rise to significant social conflicts.
4	Extense	Adverse impacts on people and/or the environment of considerable magnitude, spatial extent and duration, but more limited than Extreme (e.g. more predictable, mostly temporary impacts, reversible). Impacts of projects that may affect the human rights, lands, natural resources, territories and traditional livelihoods of indigenous peoples should be considered at the very least as potentially extensive.
3	Intermediate	Medium magnitude impacts, limited in scale (site-specific) and duration (temporary), can be avoided, managed and/or mitigated with relatively simple common measures.
2	Minor	Very small impacts in terms of severity and magnitude (e.g. small affected area, very low number of people affected) and (short) duration, can be easily avoided, managed or mitigated.
1	Negligible	Negligible negative impacts or no adverse impacts on communities, individuals and/or the environment.

This initial assessment exercise concluded that the Floresta+ Pilot Project has unique characteristics that distinguish it from many projects that are subject to environmental and social impact assessment. This commentary considers the Project's conservation goals, it's almost immaterial character, focused on financing diverse activities, developed by a wide range of individual and collective actors, referred to as the Project's "beneficiaries". Thus, and instead of an impact assessment structured on a classic positive/negative dichotomy, and based on the application of significance criteria, it was decided to develop an analysis of the project's effects following a broader classification.

The effects resulting from project implementation will be classified as:

Table 4-2. Classification of project effects.

Positive effects		
Positive impact	The project promotes a direct benefit	P
Opportunity	The project fosters favorable circumstances for the realization of a possible benefit	O
Negative effects		
Negative impact	The project promotes the occurrence of damage	N
Risk	The project fosters circumstances favorable to the occurrence of possible damage	R
Context problem	Pre-existing situation that affects project implementation and/or achievement of its objectives/targets	C

This classification grid of the effects resulting from the implementation of the Floresta+ Pilot Project is particularly appropriate in the discussion of the potentially negative effects, given that, more than negative

impacts, the implementation of this project has risks and context problems that will have to be managed in a proper way.

It should also be considered that the application of the significance criteria included in the UNDP's Environmental and Social Screening Procedures (SESP) (2021) would not make it possible to clearly distinguish the degree of significance of the consequences of Floresta+ Amazônia. Although the criteria have 5 levels of significance (see Table 4-1), these same criteria oblige that the "impacts of projects that may affect the human rights, lands, natural resources, territories and traditional livelihoods of indigenous peoples must be considered. at least as potentially extensive". This recommendation would mean that the great totality of impacts, if not all, would be assigned the same significance: extensive.

Good impact assessment practices are based on the degree of significance to distinguish adverse impacts that should be mitigated (significant ones) from those for which the application of this requirement is not required (slightly significant). This distinction will not occur in the present study of environmental and social impacts. All consequences resulting from the operationalization of Floresta+, both positive and negative, will be the subject of the same reflection: identification of mitigation or improvement measures, assessment of the need for monitoring, the opportunity to provide a capacity building and training plan, and, finally, inclusion in the complaints management plan.

The process of identifying environmental and social effects will begin with an analysis of the perceptions of stakeholders with whom different forms of dialogue have been established. General perceptions about the entire Floresta+ Pilot Project, and perceptions about each of its Modalities.

Subsequently, and in contrast to a more traditional methodology structured to assess impacts on various environmental factors (for example, human rights, biodiversity, climate change, etc.), an assessment exercise is developed that follows the planned action plan for the implementation of each Modality. The sequence of actions used includes only those actions that are considered relevant for impact assessment and, naturally, represents a simplified sequence compared to the detailed definition included in the Project Operational Manual.

The main objective of the Environmental and Social Impact Assessment of the Floresta+ Pilot Project is to assess how the actions foreseen in Floresta+ affect UNDP safeguards, and REDD+ safeguards, according to the Brazilian interpretation.

This assessment exercise is intended to go beyond the assessment itself, culminating in the design of impact management measures that allow for optimization and a more agile operationalization of the Pilot Project.

In the process of structuring the Environmental and Social Management Plan (ESMP), the IDAD/Acariquara consulting team will have the following strategic objectives:

- maximize the effectiveness of Payment Modalities for environmental services, by guaranteeing the concepts of additionality and conditionality, maximizing permanence and mitigating loss (leakage);
- increase the socio-ecological resilience of communities (Haljar et al., 2021);
- ensure that the implementation of the Floresta+ Pilot Project does not increase the pre-existing level of political and social conflicts.

4.3 STRATEGY FOR STAKEHOLDER ENGAGEMENT

The stakeholder engagement process developed for the preparation of the Environmental and Social Impact Study began with the establishment of a network of contacts and information from governmental and non-

governmental institutions, associations and cooperatives from all the states of the Legal Amazon and its representatives. This network was organized based on the definition of interest groups with the Project, which are:

1) organizations or representatives of small farmers (Family Farming);
2) Associations, groups or representatives of Traditional and Indigenous Populations and,
3) Representatives of Research and Innovation Institutions.

Initially, the mobilization of these institutions and associations took place directly through e-mails (institutional and/or personal), interested to institutional representatives and local leaders. The emails were sent at least 7 days in advance, in which confirmation of attendance was requested:

Minuta do e-mail enviado aos interessados.

Assunto: Projeto-Piloto Floresta+ (Convite para participação de diálogos para Avaliação de Impacto Sociais e Ambientais) De: _____
Data: __/__/____:
Para: E-mail da Instituição

À Nome da Instituição/Associação/Comunidade

Prezado(a) Sr(a). Coordenador/Gestor/Presidente(a),

Somos uma equipe de consultores a serviço do IDAD (Instituto de Desenvolvimento e do Ambiente - https://www.ua.pt/pt/idad/page/9171) e do Instituto Acariquara – IA (https://www.instutoacariquara.org/sobre-o-instituto) contratada pelo PNUD (Programa das Nações Unidas para o Desenvolvimento) para conduzir os estudos e diálogos com grupos de interesse para a Avaliação de Impactos Ambientais e Sociais do Projeto-Piloto Floresta+ do Ministério de Meio Ambiente, apoiado pelo PNUD com recursos do Fundo Verde para o Clima para o pagamento por serviços ambientais.

O motivo desse primeiro contato é apresentar à Nome da Instituição, o Projeto-Piloto Floresta +, e apresentar as nossas equipes. Nosso objetivo é termos a oportunidade de convidar os representantes de vossa organização a participarem desse estudo e dos momentos de diálogos com grupos de interesse a serem conduzidos nos próximos meses.

O Projeto-Piloto Floresta+ é parte do Programa Floresta+ do MMA. Uma apresentação oficial está disponível em: https://www.gov.br/mma/pt-br/assuntos/servicosambientais/florestamais/ProgramaFloresta.pdf.

Nesse documento do MMA, o Projeto-Piloto Floresta+ (Amazônia), objeto deste contato, consta na página 10.

Em anexo, acrescentamos uma breve apresentação do Projeto-Piloto Floresta+, com as informações básicas para conhecimento prévio em preparação ao nosso primeiro encontro.

O objetivo desse encontro inicial é colher as primeiras avaliações dos representantes da Nome da Instituição, quanto aos potenciais benefícios do Projeto-Piloto na perspectiva esta coordenação nacional, assim como também o que entende sua Organização serem os riscos do Projeto para os potenciais beneficiários e demais grupos de interesse.

Essas indicações a serem trazidas pela Nome da Instituição serão insumos fundamentais para a preparação do estudo para a Avaliação do Impactos Sociais e Ambientais a ser conduzido pela equipe de consultores com a participação dos diversos grupos de interesse.

Pretendemos que a nossa conversa tenha uma duração de 40 minutos e que tenha a participação de representantes da Nome da Instituição e seus convidados quantos essa coordenação entenda possam ter o interesse em colaborar.

Participarão da reunião além de nós consultores, representantes e observadores do PNUD e do MMA diretamente envolvidos com a iniciava.

Para isso, sugerimos a data de dia de Mês, pela manhã, no horário de 16h00 - 16h40 (horário Brasília).

Em nome das equipes do IDAD/IA PNUD e MMA, agradeço o interesse e disposição desta coordenação executiva em colaborar com a iniciava.

Aguardo sua resposta com a confirmação da data e horário da reunião.

Para facilitar a organização do encontro, peço que inclua na sua resposta o nome, telefone e o E-mail dos demais membros da Nome da Instituição que irão participar da reunião, para que possamos enviar o convite e o link de acesso ao ambiente virtual de reunião.

Saudações,

Nome do Coordenador do ProjetoTelefone_____
Institutos de Apoio

To engage interest groups with the Floresta+ Amazônia Pilot Project, the strategy used by IDAD and Instituto Acariquara was to outline three phases of interaction: 1) Initial Dialogues with prior invitation to participate; 2) Preparatory Webinars with participation open to the public and 3) Participatory Impact Assessment Workshops that were held in a restricted manner for previously contacted interest groups. These activities are described in detail in the "Public Participation Report for the preparation of the Environmental and Social Impact Study" completed on August 5, 2021.

4.3.1 Initial dialogues

The Initial Dialogues were held between March and April 2021[6]. In this phase, twelve (12) meetings were held online, promoted by IDAD and Instituto Acariquara on virtual platforms, due to the worsening of the COVID-19 pandemic in Brazil at the beginning of 2021.

These meetings were held for 1 hour, where initially the participants introduced themselves and/or interacted in the chat with their name, institution and contacts. The moderator then introduced the analyst from the Ministry of the Environment (MMA), who was responsible for the technical presentation of the Floresta+ Amazônia Pilot Project, and then the guests made their reflections and questions.

In this first phase, seven (07) states in the Legal Amazon were contacted with representations in Acre, Amapá, Amazonas, Maranhão, Pará, Rondônia and Roraima. In the state of Amazonas, different representatives participated in more than one meeting, Amapá representative participated in two meetings and representatives from the states of Acre, Rondônia, Roraima and Pará participated in only one meeting. In the states of Mato Grosso and Tocantins, despite the contacts established by e-mail, it was not possible to reconcile the work schedules and, therefore, there were no meetings organized by IDAD and Instituto Acariquara (Table 4-3).

Table 4-3. Initial Dialogues on the Floresta+ Amazônia Pilot Project, carried out by IDAD/IA in the Legal Amazon States.

Initial Dialogues	Meetings Held Floresta + Amazônia Project	Date	Meeting Format	States consulted	Modalities
01	National Council of Extractivist Populations – CNS and Memorial Chico Mendes	08/03/2021	Online	Amazonas	Family Farmers and 3rd Sector Organizations
02	Amazon Conservation and Sustainable Development Institute - IDESAM	08/03/2021	Online	Amazonas	3rd Sector Organizations
03	International Forestry Research Center - CIFOR/ICRAF	09/03/2021	Online	-	3rd Sector Organizations
04	Sustainable Amazon Foundation	11/03/2021	Online	Amazonas	3rd Sector Organizations
05	Coordination of Indigenous Organizations of the Brazilian Amazon - COIAB	17/03/2021	Online	Nacional	Indigenous Peoples
06	GCF Regional Committee Comitê Regional do GCF	18/03/2021	Online	Acre, Rondônia and Roraima	Indigenous Peoples
07	National Confederation of Agricultural Workers – CONTAG	22/03/2021	Online	Maranhão and Amazonas	Family Farmers
08	National Coordination for the Articulation of Quilombola Black Rural Communities – CONAQ and ISA	25/03/2021	Online	Nacional and Maranhão	Quilombolas and 3rd sector organizations
09	1st Consultation of Amapá and Indigenous Peoples with Amapá and Indigenous Peoples - APOIANP	29/03/2021	Online	Amapá	Indigenous Peoples
10	Amapá Integrated Research Network – RIPAP	07/04/2021	Online	Amapá	3rd Sector Organizations
11	Amazon Environmental Research Institute – IPAM	09/04/2021	Online	Nacional	3rd Sector Organizations
12	Amazon Institute of Man and Environment – IMAZON	12/04/2021	Online	Pará	3rd Sector Organizations

[6] Initial Dialogues Report with registration links and access to Virtual Meetings https://www.dropbox.com/sh/ccn9jkrk0cen8mo/AABH4niTqWMcwdsdNze3frxea?dl=0

In these Initial Dialogues 72 people were involved, with 58% of men and 42% of women participating. The invited interest groups were representatives of family farmers (CNS and CONTAG), communities and traditional peoples (CONAQ, COIAB, GCF Regional Committee and APOIANP) and 3rd sector organizations (RIPAP, PAM, IMAZON, ISA, IDESAM, CIFOR/ICRAF, Fundação Amazônia Sustentável and Memorial Chico Mendes) operating in the states of the Legal Amazon which fall under the Modalities that are requirements for participating in the Floresta+ Amazônia Pilot Project (Table 4-4).

Table 4-4. Contact with representative institutions operating in the Legal Amazon, distributed in the Project's Funding Modalities.

Modalities 1 and 2	Agricultores Familiares	CNS	03 representatives
		CONTAG	12 representatives
Modality 3	Traditional communities (Quilombolas (descendants of African slaves who took refuge in Quilombo territories) and Indigenous peoples)	CONAQ	03 representatives
		COIAB	02 representatives
		GCF Regional Committee	10 representatives
		APOIANP	10 representatives
Modality 4	3rd Sector Organizations	RIPAP	10 representatives
		IPAM	05 representatives
		IMAZON	06 representatives
		ISA	02 representatives
		IDESAM	01 representatives
		CIFOR/ICRAF	04 representatives
		Fundação Amazônia Sustentável	03 representatives
		Memorial Chico Mendes	01 representatives

In this first phase, Maranhão and Amazonas with 45% and Amapá (18%) had the highest number of participants in these meetings, Pará had 10% and Roraima, Rondônia and Acre had 9% of participation in each state (Figure 4-3).

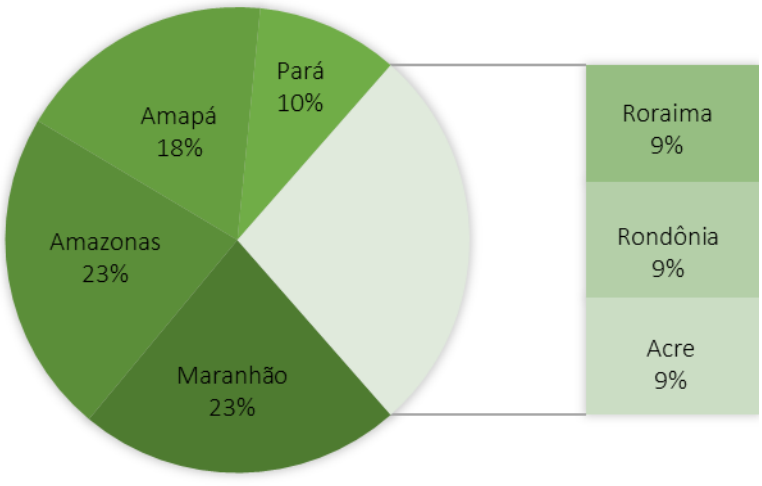


Figure 4-3. Percentage of participation by State in the Initial Dialogues, held by IDAD and Instituto Acariquara.

At the end of each meeting, the guests made their remarks and the most relevant questions were related to the planning, elaboration and execution of the Project in the Legal Amazon. All representatives invited in this first phase of engagement showed interest in actively participating in the preparation of the Project's risk and impact studies.

4.3.2 Preparatory webinars

The Project's second phase of engagement was the promotion of Preparatory Webinars. These Webinars were based on roundtables with an average duration of 1 hour and 30 minutes and broadcast live via social networks. The roundtable started with: 1) presentation/exhibition of the Pilot Project; 2 interventions by invited debaters;

3) questions between debaters; 4) reading the audience's questions via chat; 5) comments from debaters; 6) comments by the mediator (main points) and 7) closing.

For this engagement phase, the contact of the invited debaters was made by e-mail from the articulations established in the Initial Dialogues and by indication of the UNDP and MMA. These debaters were prominent people appointed both by the organizations and by the UNDP and MMA, among researchers, representatives and leaders of interest groups in each of the nine states in the Legal Amazon, appointed as the target audience for each of the four editions of the Webinars.

Once the work agendas were agreed upon and the presence of debaters was confirmed at the events, the calls on social networks and a technical video[7] of the Pilot Project were created, which was presented at the beginning of each edition, and served as a basis for addressing the discussions during the Webinars (Figure 4-4).

Figure 4-4. Calls via social network for Preparatory Webinars held by IDAD and Instituto Acariquara.

[7] Technical presentation video of the Floresta+ Amazônia Pilot Project: https://youtu.be/XiY-6rJw4LI

The Webinars[8] took place between April 27 and 30, 2021, with the participation of representatives from the nine states of the Legal Amazon. In this engagement phase, debaters with representations of family farmers, small farmers, communities and traditional peoples, researchers from Research Institutions, professors from Federal Universities, representatives of governmental and non-governmental organizations and associations of traditional communities were invited to debate about the Floresta+ Amazônia Pilot Project (Table 4-5).

Table 4-5. Realization of Preparatory Webinars for the Forest+ Amazônia Pilot Project.

Preparatory Webinars	Date	States	Institutions/Organizations	Live Audience
 Webinários Amazônia Floresta+ Diálo... O objetivo dessa série de webinários preparatórios é sensibilizar e mobilizar o...	27 de abr. de 2021 Transmitido	Acre e Rondônia	FETRAGRO, GTEQGCF, EMBRAPA-AC, GTA, ECOPORÉ e Associação de Defesa Etnoambiental Canindé	426
 Webinários Amazônia Floresta+ Diálo... O objetivo dessa série de webinários preparatórios é sensibilizar e mobilizar o...	28 de abr. de 2021 Transmitido	Amazonas e Roraima	INPA, FAEA/CNA e CIR	199
 Webinários Amazônia Floresta+ Diálo... O objetivo dessa série de webinários preparatórios é sensibilizar e mobilizar o...	29 de abr. de 2021 Transmitido	Amapá, Pará e Maranhão	FETAEMA, CNS, UFMG e ASPEB	165
 Webinários Amazônia Floresta+ Diálo... O objetivo dessa série de webinários preparatórios é sensibilizar e mobilizar o...	30 de abr. de 2021 Transmitido	Mato Grosso e Tocantins	SEMA-TG, FETAET e GIZ	65

For the editions of the Webinars, 21 debaters were invited, however, 16 guests attended, being 8 women and 8 men. Of these, there was a higher percentage of female debaters present in the Preparatory Webinars in Acre and Rondônia (67%) and Mato Grosso and Tocantins (67%) and the highest percentage of male debaters occurred in the Webinars of Amazonas and Roraima (67%) and Amapá, Pará and Maranhão with 75% (Table 4-6). One of the main reasons for the absence of confirmed debaters in the Webinars was the instability of the internet signal in places with greater access difficulties.

Table 4-6. Percentage of participation of men and women as debaters in the States.

Participation in the States		Women	Men
Webinar 1	Acre and Rondônia	67%	33%
Webinar 2	Amazonas and Roraima	33%	67%
Webinar 3	Amapá, Pará and Maranhão	25%	75%
Webinar 4	Mato Grosso and Tocantins	67%	33%

The Preparatory Webinars were carried out by the Stream Yard platform and broadcast live on YouTube and Facebook channels of Instituto Acariquara. In the first Webinar, intense calls were made on social networks and registration from the external public, guaranteeing a 50% audience on the first day. However, as the Webinars were disabled from virtual platforms (YouTube and Facebook) soon after they were held, audience participation and frequency dropped, to the point that, in the fourth and last Webinar, there was only 8% of the audience that had been following the discussions live (Figure 4-5).

[8] Recording of virtual webinars: https://drive.google.com/drive/folders/1_9N1507kkZwQ3w2CU3tcKwvUdsYHXKGfReport https://www.dropbox.com/sh/uapc3vnvxbw12e8/AACAjoWBnpW8n2v80Xo_khtCa?dl=0

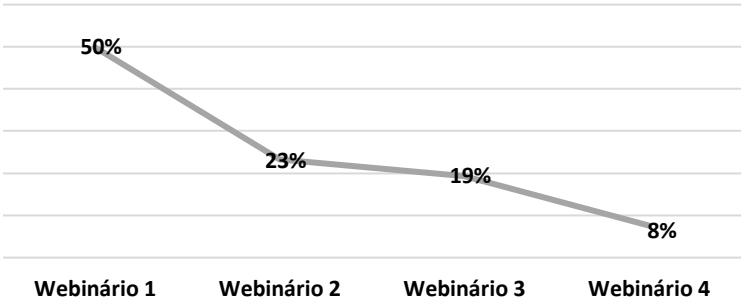


Figure 4-5. . Frequency of audience in Preparatory Webinars held between April 27th and 30th.

4.3.3 Participatory Impact Assessment workshops

The Participatory Workshops aimed to assess the Project's potential positive and negative impacts and propose mitigation measures from the perspective of potential beneficiaries and other interest groups. Mobilizing organizations were nominated by their respective national and state grassroots organizations. Initially, 07 workshops were planned with specific interest groups, with exclusive programming for guests and without live broadcasting through the ZOOM application (Table 4-7).

Table 4-7. Planning of Workshops with mobilizing organizations in the States.

Date	Time (Brasília)	Segments	Mobilizing Organizations
May, 11th	10 – 12:30	Environmental Analysts	MMA (Department of Forest Conservation and Environmental and Ecosystem Services – DECO), SFB and FUNAI and SAF/MAPA, ICMBio.
May, 14th	9 – 17:30	Family farmers	States Fetagri
May, 17th	9 – 17:30	Small Owners	Federation of Farmers of the States /CNA
May, 18th	9 – 17:30	Indigenous Peoples	COIAB, Indigenous State Councils
May 21st	9 – 17:30	Traditional Communities	CNS, PIPCTs State Councils
May, 24th	9 – 17:30	Rural Quilombolas	Quilombolas State movements
May, 26th	9 – 17:30	Innovation Sector	CNA, OCB, environment NGOs, Research Institutions.

Of the seven scheduled workshops, only five took place (11th, 14th, 18th, 21st and 26th of May). There was no workshop held on May 17th, as the only federation that responded to the email and accepted the invitation was the FAEA, however all the other 8 (eight) were contacted by e-mail and through the CNA, but did not respond, despite the CNA having a seat on the Project's advisory committee. Also, on May 24th, there was no workshop, as representatives of CONAQ and MIQCB refused to participate.

Around 150 people participated in the five Workshops, distributed among 43% women and 57% men (Table 4-8).

Table 4-8. Governmental, non-governmental institutions and social groups contacted via e-mail to participate in the Floresta+ Amazônia Pilot Project Workshops.

Organizações/Instituições	*State*	*Gender*		*Global total*
		F	M	
Enviromnetal analysts				

Organizações/Instituições	State	Gender		Global total
		F	M	
FUNAI	DF	1	1	2
ICMBIO	DF	-	1	1
MAPA	DF	2	2	4
MMA	DF	3	3	6
PNUD	DF/SC	2	5	7
Total		**8**	**12**	**20**
Family farmers				
CONTAG	AM / MA	2	2	4
FEATACRE	AC	2	2	4
FETACRE	AC	-	1	1
FETAEMA	MA	1	3	4
FETAET	TO	2	1	3
FETAGRI	AM / PA	2	3	5
FETAGRIMT	MT	-	2	2
FETAGRO	RO	1	1	2
FETRAF	AP / PA	-	2	2
FETRAFERR	RR	2	2	4
Total		**12**	**19**	**31**
Indigenous peoples				
APOIANP	AP	1	1	2
ARPIT	TO	-	2	2
CIR	RR	2	1	3
COAIB/COICA	AC	-	1	1
COAPIMA	MA	1	-	1
Etnia Iny Karajá	TO	1	-	1
FEPOIMT	MT	1	2	3
FOIRN	AM	-	2	2
FUNAI	Nacional	2	1	3
GTE/GCF	AC	1	-	1
SEDAM	RO	1	-	1
SIPE	AP	1	-	1
UMIAMB	RR	1	-	1
Total		**12**	**10**	**22**
Extractivists / PCTs				
Associação Afro-brasileira Quilombola de Jutaí	PA	1	-	1
Associação da Escola Família Agroextrativista do Maracá / Núcleo de Mudanças Climáticas e Biomas da Caritas Diocesana de Macapá	AP	-	1	1
Associação dos Moradores Agroextrativistas da RESEX Guariba Roosevelt	MT	-	1	1
Barreirinha	AM	1	2	3
CNPCT	MT	1		1
CNS	AC / AP / MA / MT / RO / RR / TO	5	4	9
Comitê Chico Mendes	AC	1	-	1
CONAQ	MA	1	-	1
Conselho Indígena de Roraima / Conselho Deliberativo do CNS	RR	1	-	1
FMMC	MT	-	1	1
FOPAAM	AM	-	1	1
Larantijuba em Moju	PA	-	1	1

Organizações/Instituições	State	Gender		Global total
		F	M	
Liderança Extrativista	TO	-	1	1
Mamirauá	AM	1		1
Chico Mendes / CNS	PA	-	1	1
MPP - Movimento de Pescadoras do Pará	PA	1	-	1
Novo Airão	AM	-	1	1
PAE Foz do Mazagão/CNS	AP	-	1	1
PAE Ilha São João	PA	1		1
PAE Lago Grande	PA	-	1	1
Quilombo Enseada da Mata	MA	1	-	1
Quilombo Mutuca	MT	1	-	1
RDS AMANÃ	AM	1	-	1
RDS Rio Amapá	AM	1	-	1
RDS Uacari	AM	-	1	1
RESEX Enseada da Mata/CNS	MA	1	-	1
Terra Indígena Apurinã / FOCIMP de Lábrea- AM	AM	-	1	1
Total		**19**	**18**	**37**
	Innovation			
CNA	DF	1	-	1
ECOPORÉ	RO	-	2	2
EMBRAPA	AC / AP / PA	-	3	3
GIZ	DF	-	1	1
GTA	AC / AP / ES / PA	2	2	4
IDESAM	AM	-	2	2
IEA	PR	1	-	1
IPEA	DF	1	1	2
ISA	DF	1	-	1
Kanindé	RO	1	-	1
Mamirauá	AM	1	-	1
MMA	DF	-	1	1
OCB	DF	-	1	1
RLadies	RJ	1	-	1
SEBRAE		1	1	2
SEMA	MT	1	1	2
SENADO	DF	-	1	1
UEAP	AP	1	1	2
UFMG	MG	-	1	1
USP	SP	-	2	2
WCS	AM	-	1	1
Total		**12**	**21**	**33**

In general, institutions or organizations that have not identified active institutional e-mails were contacted through the Call Center, for instructions on participation in the events. The states with the highest number of institutions/organizations that confirmed their participation in the events through the Call Center were Mato Grosso, Pará, Amazonas and Maranhão (Figure 4-6).

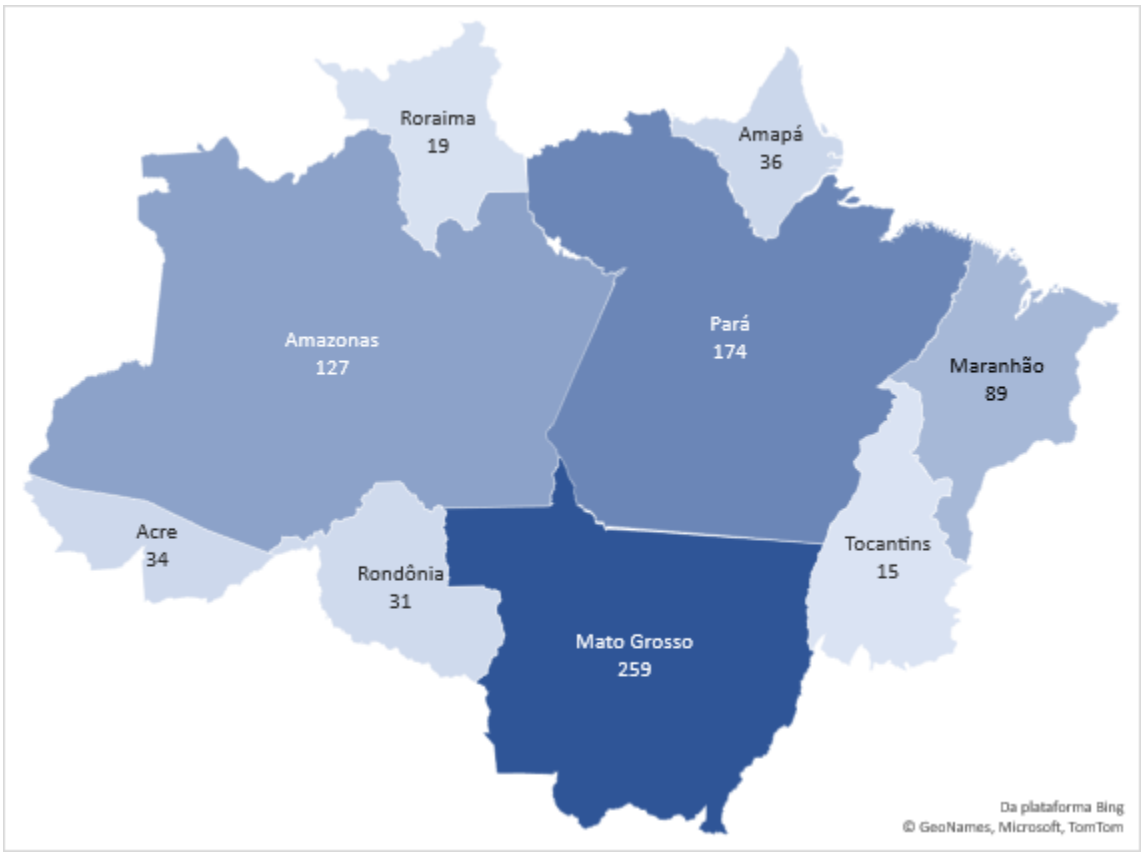


Figure 4-6. Number of institutions/organizations confirmed to participate in the events of the Floresta+ Amazônia Pilot Project.

The workshops[9] that took place were divided into two stages. In the morning, it was conducted in the form of a plenary, aimed at leveling information on: (1) The project and its Modalities; (2) Safeguards and mechanisms for good project governance; (3) Project impact assessment process; followed by question-and-answer sessions. In the afternoon, group dynamics took place, divided into two thematic blocks: (A) Risks, impacts and opportunities; (B) Mitigation measures and had the groups divided into simultaneous rooms in the ZOOM application.

The engagement stages and the results of the workshops served as a basis for analysis during the elaboration of the ESIA, carried out by IDAD and Instituto Acariquara.

[9] Participatory Workshop Records https://drive.google.com/drive/folders/10LMHidFpplib8IGszRTy7QVaHU-XKiF8

5. BASELINE DATA

This chapter includes a detailed characterization, focused on themes considered relevant for the evaluation of the Floresta+ Pilot Project. It should be kept in mind that the selected analytical dimensions are the result of an environmental and social risk assessment process, based on the prior definition of a set of safeguards that are intended to be guaranteed with the implementation of the Floresta+ Amazônia Pilot Project.

Figure 5-1 Pictorial description of the chapter's structure.

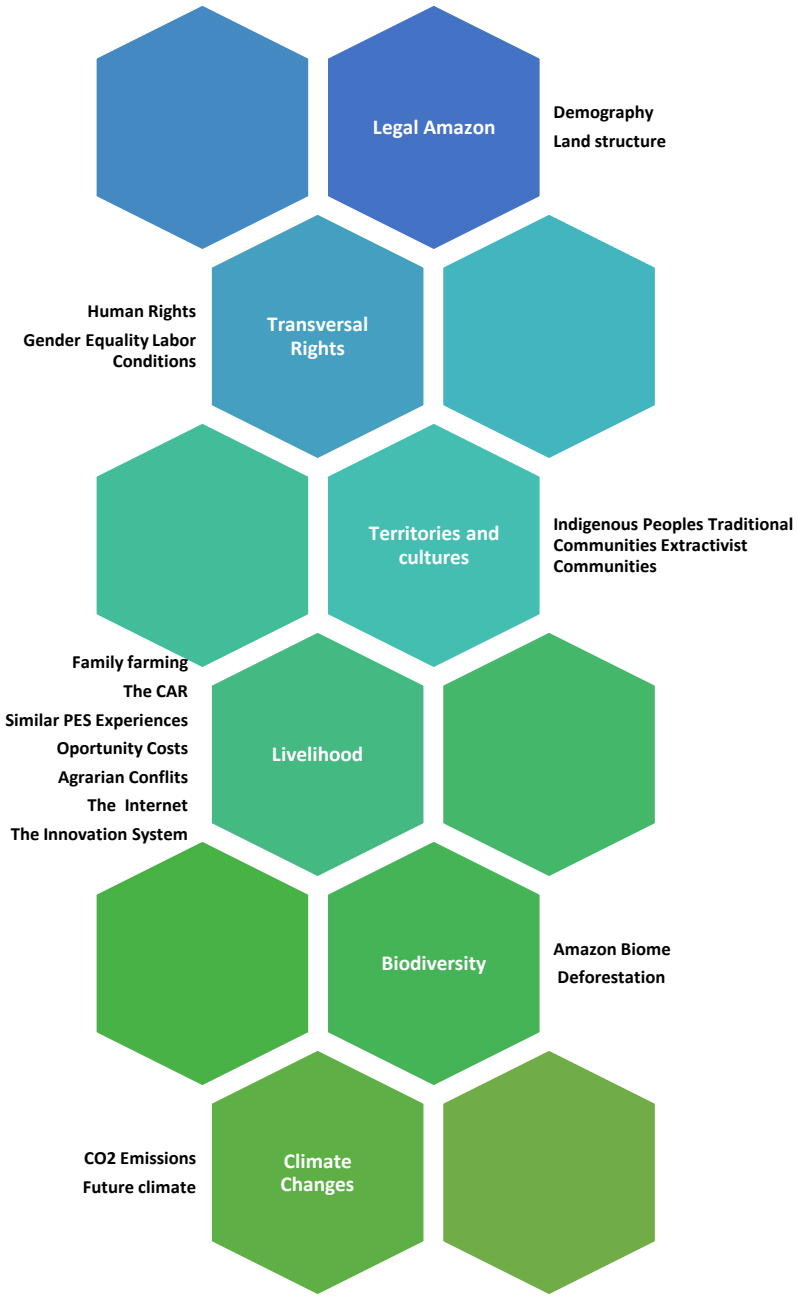


Figure 5-1. Structure adopted in the baseline description.

5.1 LEGAL AMAZON

The Legal Amazon is a political-administrative concept created by the Brazilian government for the social and economic development of the states in the Amazon region. The limit of the Legal Amazon was established by Law 1,806, of January 6th, 1953, with subsequent changes in its delimitation according to the political-administrative evolution of the Brazilian territory.

The Legal Amazon encompasses the States of Acre, Amapá, Amazonas, Mato Grosso, Pará, Rondônia, Roraima and Tocantins, and part of the State of Maranhão. The Legal Amazon is recurrently part of global discourses due to its importance for the contemporary world and its representation as an environmental and economic entity (Floresta Amazônica, 2019), has several attractive products with the potential to generate significant economic results.

5.1.1 Demografic Data

The Legal Amazon, according to a study by the Superintendence for the Development of the Amazon (SUDAM) is a territory of 5 million km2 in extension and is equivalent to 59.1% of the entire territory of Brazil. Its total population is 28.1 million inhabitants, making up 13.3% of the national population, with 19.9 million (72%) living in urban areas and 7.8 million (28%) people living in rural areas. It is important to note the demographic difference between the 9 states of the Legal Amazon, noting that 30% of the population is in the state of Pará, 21% in the state of Maranhão, 15% in the state of Amazonas and 12.5% in the state of Mato Grosso, while the population of each of the other states does not exceed 6.5% of the total population of the region.

Another regional difference, compared to other Brazilian regions, the GDP of the Legal Amazon, equivalent to 8.8% of the national value, in 2018, was 613.3 billion reais. Table 5-1 summarizes these data.

Table 5-1. Basic data for the Legal Amazon.

Information	Legal Amazon	% of Brazil
Area (in Km^2)	5 million	59,1%
No. of Municipalities	772	13,9%
Total Population (hab.) (2020)	28,1 million	13,3%
Urban Population (hab.) (2015)	19,9 million (72%)	-
Rural Population (hab.) (2015)	7,8 million (28%)	-
Amazon GDP (2018)	613,3 billion	8,8%

Source: adapted from http://repositorio.sudam.gov.br/sudam/biblioteca/publicacoes-institucionais/sintese-de-indicadores-da-amzonia-legal-2020.pdf .

As Brazil is a federative republic with three government spheres (Union, States and Municipalities), it is important to know that the Legal Amazon totals 772 Municipalities, and in the State of Maranhão only 181 of its municipalities[10] are part of the Legal Amazon. Table 5-2 indicates the states that make up the Legal Amazon and the number of existing municipalities per state.

[10] The state of Maranhão has a total of 217 municipalities, however only 181 of these are part of the region called Legal Amazon. Disaggregated data are not always available at the municipal level, so average data for the entire state may be used, when this occurs, it will be informed in a note that the information refers to all municipalities in the state and not just those that make up the Legal Amazon.

Table 5-2. Municipalities belonging to the Legal Amazon by State.

State	Number of Municipalities
Rondônia	52
Acre	22
Amazonas	62
Roraima	15
Pará	144
Amapá	16
Tocantins	139
Mato Grosso	141
Maranhão	181

Fonte: IBGE, https://www.ibge.gov.br/geociencias/cartas-e-mapas/mapas-regionais/15819-amazonia-legal.html?=&t=o-que-e .

Among the municipalities in the Amazon, 60% have a maximum of 20 thousand inhabitants, and most Amazon municipalities do not have a total population greater than 50 thousand inhabitants and only 1% have a population greater than 500 thousand inhabitants[11]. Table 5-3 indicates the population size of the region's municipalities.

Table 5-3. Distribution of municipalities by population size in the Legal Amazon. Source: SUDAM, http://repositorio.sudam.gov.br/sudam/biblioteca/publicacoes-institucionais/sintese-de-indicadores-da-amzonia-legal-2020.pdf

Population size	Number of Municipalities (2020)	Percentage of Municipalities (2020)
Up to 5 thousand inhab.	114	15%
5 mil – 10 thousand inhab.	138	18%
10 mil – 20 thousand inhab.	212	27%
20 mil – 50 thousand inhab.	203	26%
50 mil – 100 thousand inhab.	62	8%
100 mil – 500 thousand inhab.	36	5%
Above 500 thousand inhab.	7	1%

Following the national trend, the population of the states that make up the Legal Amazon mostly reside in urban areas. However, except for Amapá, all other states have a rural population rate above the national value. While, in 2010, the Brazilian rural population was 15.64%, in Amapá the rate was 10.23%, in Maranhão it was 18.20% and in other states the values exceeded 20%, reaching 31.52% in the state of Pará and 36.92% in the state of Mato Grosso. A study by the Brazilian Agricultural Research Corporation (EMBRAPA)[12] indicates that there was a significant movement of rural-urban migration in the North of Brazil between 1970 and 2007, with a decrease in the rural population of 3.36% per year. Given the importance of linking the beneficiaries of the Floresta+ Pilot Project with the rural territory to adhere to the proposed payments for environmental services, it is important to observe trends in rural exodus and ensure conditions for the beneficiaries to remain in the countryside, as

[11] Available from: https://www.ibge.gov.br/geociencias/cartas-e-mapas/mapas-regionais/15819-amazonia-legal.html?=&t=o-que-e

[12] Available from: https://www.infoteca.cnptia.embrapa.br/bitstream/doc/907075/1/GBMJEstudoAMZDA1vISSN.pdf

well as monitoring this situation. Percentage data on the housing situation of the Brazilian population and the Amazon states are presented in Table 5-4.

Table 5-4. Percentage of resident population by household situation (urban and rural). Source: IBGE - CENSO, 2010.https://sidra.ibge.gov.br/tabela/761#resultado.

Brazil and States of the Legal Amazon	Urban Population (%)	Rural Population (%)
Rondônia	73.6	26.5
Acre	72.6	27.4
Amazonas	79.1	20,9
Roraima	76.6	23.5
Pará	68.5	31.5
Amapá	89.8	10.3
Tocantins	78.8	21.2
Mato Grosso	63.1	36.9
Maranhão[13]	81.8	18.2
Brasil	84.4	15.6

The demographic density of the states in the Legal Amazon is relatively lower than the national average, which is 22.43 (inhabitants per square kilometer) according to the 2010 CENSUS, IBGE. Only the state of Maranhão[14] comes close to the national value, having 19.81 inhabitants/km^2. Among the other states, only Rondônia and Pará exceed 6 inhab/km^2, respectively, with 6.58 inhab/km^2 and 6.07 inhab/km^2. Table 5-5 presents the values by state and for Brazil.

Table 5-5. Demographic density in Brazil and in the states of the Legal Amazon. Source: Adapted from the IBGE Demographic Census, 2010.

Brazil and States of the Legal Amazon	Inhabitants per km² (2010)
Brasil	22.43
Rondônia	6.58
Acre	4.47
Amazonas	2.23
Roraima	2.01
Pará	6.07
Amapá	4.69
Tocantins	4.98
Maranhão	19.81
Mato Grosso	3.36

[13] Value for the entire state of Maranhão and not just for municipalities belonging to the Legal Amazon

[14] Value for the entire state of Maranhão and not just for municipalities belonging to the Legal Amazon

5.1.2 Structure and Land Regularization of the Legal Amazon

Understanding the structure and status of a territory's land tenure process is a sine qua non condition for the construction and delimitation of public policies in the field and for environmental conservation and preservation.

Land is fundamental for agricultural production and housing, and the way it is distributed and appropriated determines the relationships that make up the agrarian issue.

Land regularization can be defined as the set of legal, urban, environmental, and social measures that aim to regularize irregular settlements and the title of their occupants, to guarantee the social right to housing, the right to an ecologically balanced environment and the full development of the social functions of urban property.

When it comes to the Legal Amazon, this understanding becomes a more complex challenge, since this region comprises 9 states, where each state has a specific process of occupation and exploration. However, in general, it is known that one of the greatest weaknesses about land tenure regularization in the Amazon is knowing who owns the land and what is the purpose attributed to that land.

For a better understanding of the current land tenure situation in the Amazon, it is necessary to resort to the historical process to which the territory was submitted. The existing land chaos in the Amazon can be largely explained by the enactment of the Land Law, as Law No. 601 of September 18, 1850 became known. This law was the first legal provision that sought to regulate the land issue in the Brazil Empire.

Among the provisions of the law was that the only way to access the nation's vacant lands (unoccupied lands are public lands not yet allocated by the Government for legal use and which at no time were part of the property of a private individual, even if they are illegally in their possession) was through the purchase from the state at a public auction (procedural act by which pledged assets were sold), ensuring the revalidation of the old sesmarias, which was until then the form of land donation by the State to the private sector and the possessions held until that time. Among the Law's exceptions were lands located on the borders, which would be granted free of charge by the state in an area of up to ten leagues from the border.

However, the land law contributed to land concentration in the country, illegal occupation of land, lack of demarcation and regularization, and its effects can still be seen today, especially in the Amazon.

Below is a detailed description of the land tenure structure and regularization of each of the 9 states in the Legal Amazon, including the mapping of the territorial delimitation of the state, the Conservation Units, indigenous lands and INCRA certified properties.

Acre

Regarding the structure and land tenure regularization of the state of Acre, about 35% of the state's land, comprising protected areas such as Federal and State Conservation Units, of which three are fully protected: Acre River Ecological Station, National Park Serra do Divisor - managed by the Federal Government - and Chandless State Park, managed by the State Secretariat for the Environment (SEMA) and 19 sustainable use units, which allow the presence of residents (Figure 5-2).

Indigenous lands occupy 14.56% of the entire territory of Acre, totaling 35 indigenous lands in the state, recognized by the federal government. Of this total, 24 indigenous lands are fully regularized, with their physical demarcations ratified by presidential decrees. Currently about 50% of Acre is made up of indigenous lands and conservation units.

Regarding land tenure regularization, the state of Acre has a specific characteristic, since, of its 22 municipalities, 16 have 100% of their territory within the border strip. Thus, the regularization of lands inserted in border areas requires authorization from the National Security Council for regularization, which makes the process lengthy. The agency responsible for managing state areas in Acre is the Land Institute of Acre (ITERACRE), which is part of the structure of the State Secretariat for the Environment (SEMA).

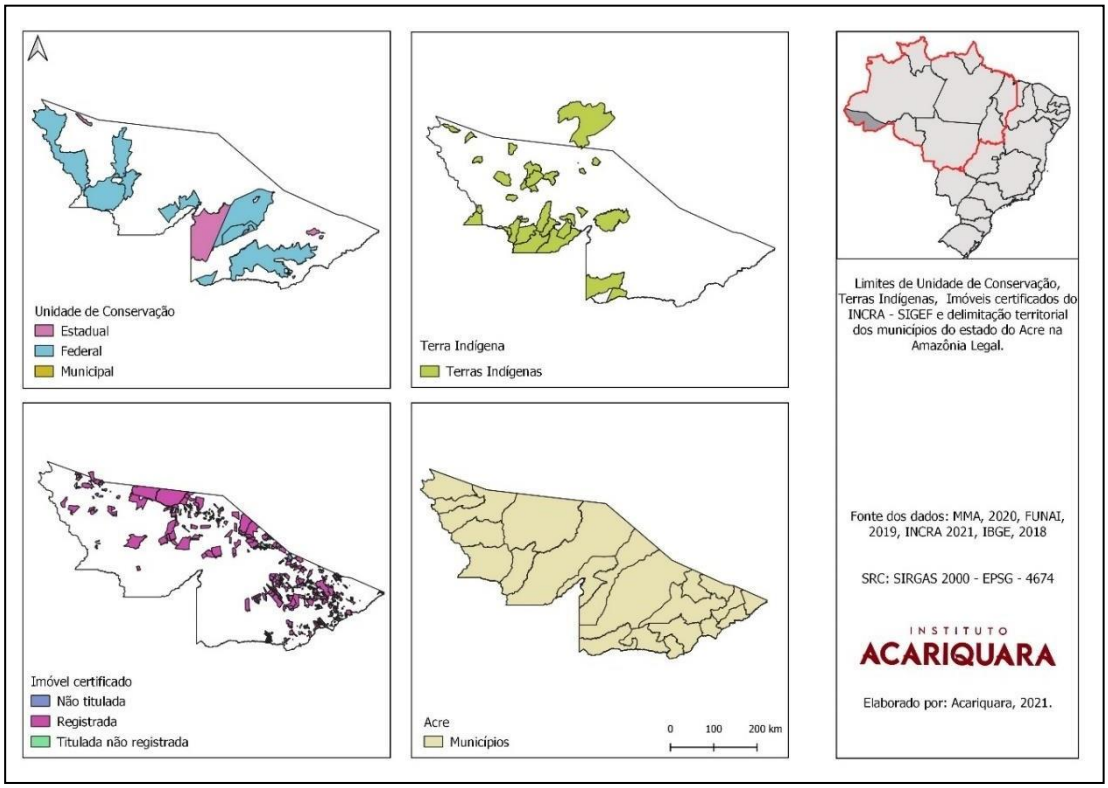


Figure 5-2. Map of conservation units, indigenous lands, INCRA certified properties and territorial delimitation of thestate of Acre.

According to data provided by the Land Management System (SIGEF) of the National Institute for Colonization and Agrarian Reform (INCRA), until 05/31/2021, 1221 parcels had been certified, covering an area of 2,644,159 hectares in the state, equivalent to 1.73% of the total area of the state

Amazonas

The state of Amazonas has 76 Conservation Units (UCs) between federal and state. The state-owned a total of 41 UCs and are under the responsibility of the State Secretariat for the Environment (SEMA), 32 of which are for Sustainable Use and 9 for Integral Protection, distributed over approximately 19 million hectares. There are 35 federally controlled UCs, 26 of which are for Sustainable Use and 9 for Integral Protection, representing 23 million hectares. The two Conservation Unit Modalities in the state of Amazonas, when added together, are equivalent to 27.1% of the territory (Figure 5-3).

Indigenous lands, in turn, represent 27.7% of the territory of Amazonas, distributed in 173 indigenous lands and 66 ethnic groups, being the state of the federation with the largest number of indigenous lands in terms of size and quantity. Together, Indigenous Lands and Conservation Units are equivalent to 54.8% of legally protected territory.

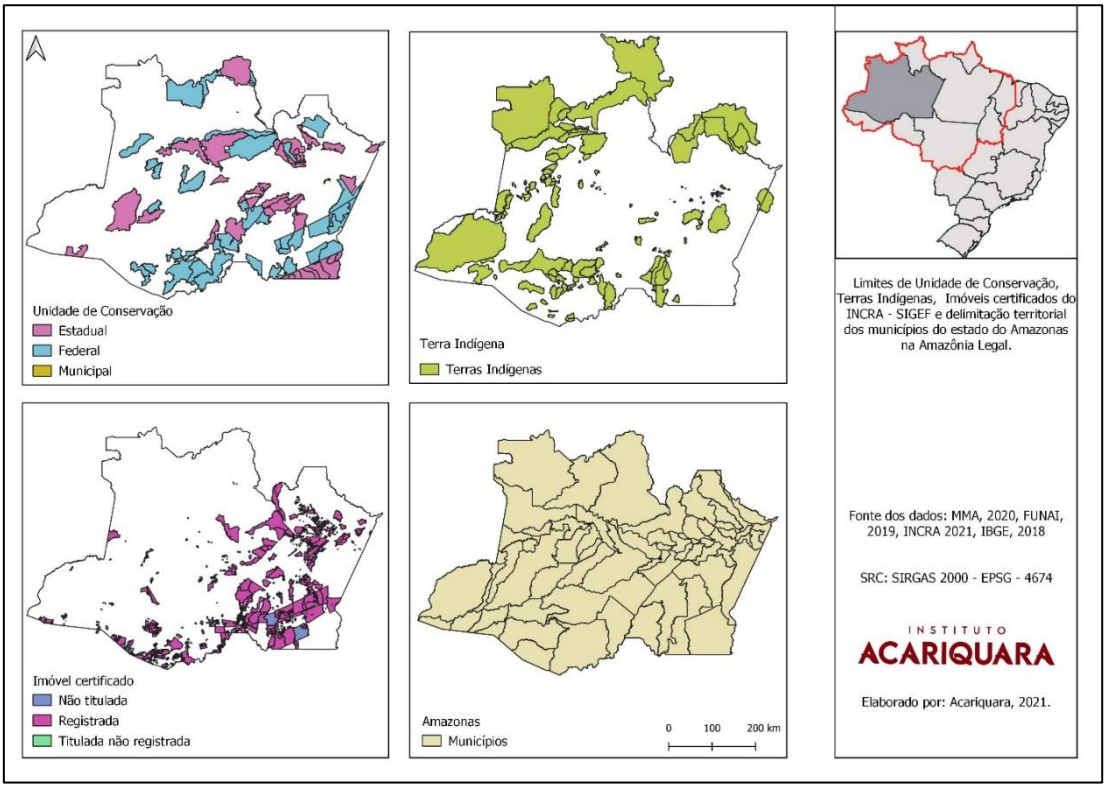


Figure 5-3. Map of conservation units, indigenous lands, INCRA certified properties and territorial delimitation of the stateof Amazonas.

In the state of Amazonas, the agency responsible for urban and rural land claims is the Land Policy Secretariat (SPF). Regarding land tenure regularization in the state, until 05/31/2021, the database provided by the Land Management System (SIGEF) contained 4,544 certified parcels in the state of Amazonas, totaling 23,020,258.94 hectares, a number corresponding to 14% of the territorial extension of the state. Among the municipalities with the highest number of certified parcels are Canutama with 570, Humaitá with 466, Itacoatiara with 423 and Presidente Figueiredo with 342

Amapá

Amapá has 16 conservation units, 7 of which are at the federal level, 8 at the state level and 1 at the municipal level. Together these units total 8,798,040.31 ha of state territory. In relation to indigenous lands, Amapá was the first Brazilian state to have all its lands demarcated; as a whole, the state has 5 indigenous lands, which occupy a total area of 1,183,498.31 ha, equivalent to 8.29% of the state's surface (Figure 5-4).

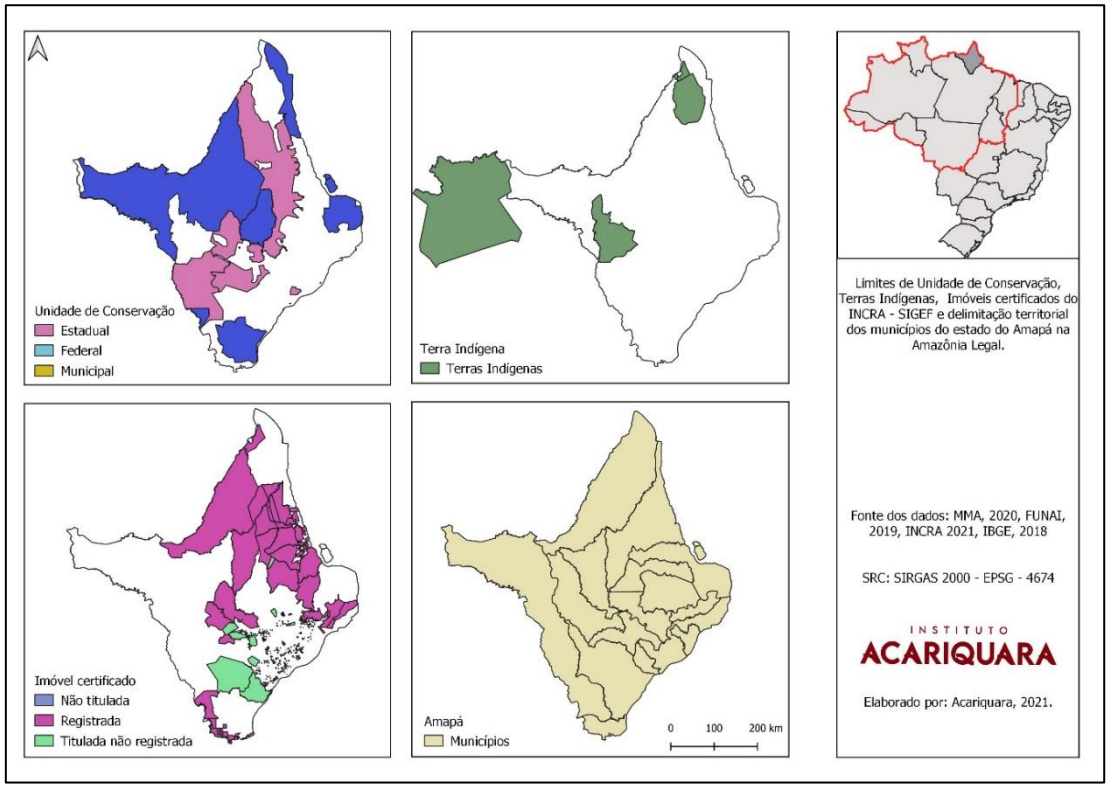


Figure 5-4. Map of conservation units, indigenous lands, INCRA certified properties and territorial delimitation of thestate of Amapá.

Regarding its land tenure regularization, until 05/31/2021, the database made available by the Land Management System (SIGEF) contained 715 certified parcels in the state, totaling 5,495,225.12 hectares, a figure corresponding to 38% of the territorial extension of the state. The municipalities with the highest number of parcels registered in the state are Macapá with 188, Porto Grande with 133 and Santana with 77.

Mato Grosso

The state of Mato Grosso currently has 52 conservation units, of which 11 are under federal domain, 39 under state domain and 2 under municipal domain. About indigenous lands, the state has 73 lands between regularized, demarcated and homologated, making up an area of 90,677,065 hectares, equivalent to 16.57% of the federation unit. The Conservation Units and indigenous lands combined result in 17.1 million hectares, which corresponds to 19% of the state's territory (Figure 5-5).

Regarding land tenure regularization in the state, until 05/31/2021, the database provided by the Land Management System (SIGEF) contained 56,489 certified parcels in the state, totaling 38,003,321.00 hectares, a number corresponding to 42% territorial extension of the state. The state of Mato Grosso is distinguished by having certified parcels in all municipalities in the unit, with the municipalities of Sapezal, Porto Estrela and Nova Monte Verde having the highest number of parcels, 1558, 1480 and 1370 respectively.

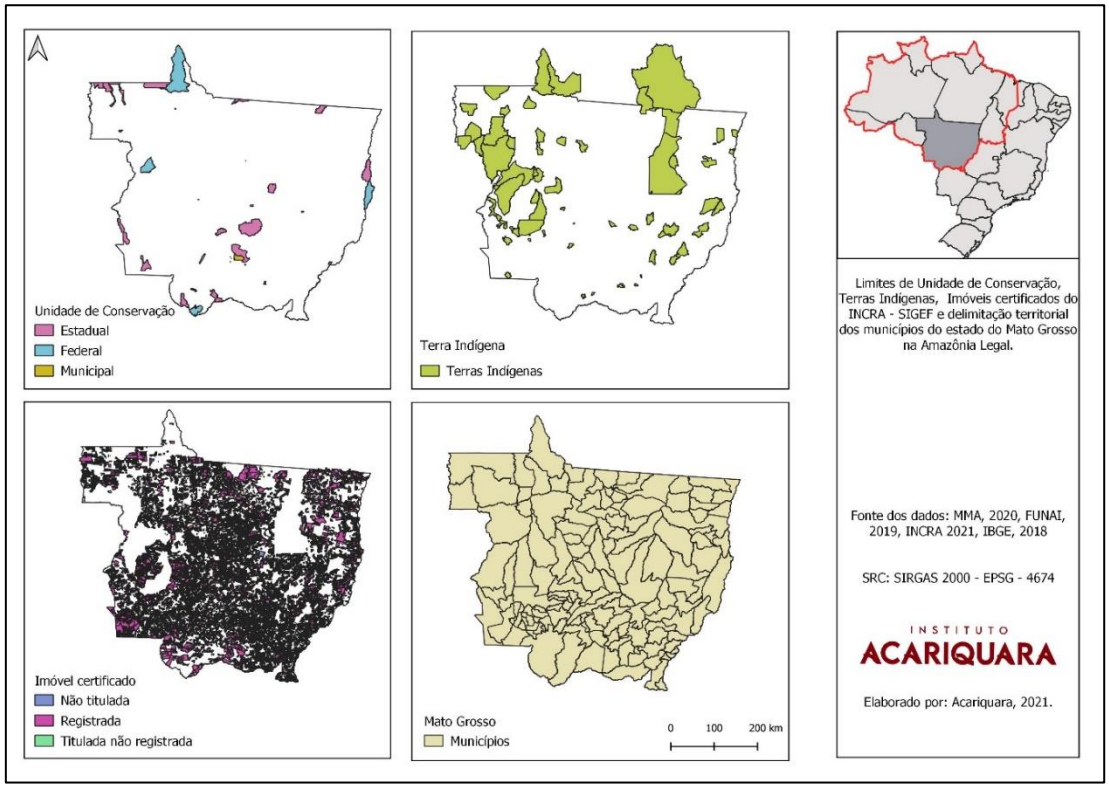


Figure 5-5. Map of conservation units, indigenous lands, INCRA certified properties and territorial delimitation of the stateof Mato Grosso.

In a study carried out in 2021 by the Amazon Institute of Man and Environment (IMAZON) in partnership with the Centro de Vida Institute (ICV) on land regularization in Mato Grosso, it indicated that about 10.5% of the state's territory, the equivalent of about 9.3 million hectares, is not allocated or there is no information about their allocation. Most of this unallocated area (57%) belongs to the state government and occupies 6% of Mato Grosso and is already registered in the Rural Environmental Registry (CAR).

Pará

In relation to the state of Pará, there are currently 87 conservation units: of these, 54 in federal domain, 29 in state domain and 3 in municipal domain. These units together occupy an area of 15,058,480 hectares, approximately 12.1% of the state's territory. Regarding indigenous lands, the state has 56 lands between regularized, declared and under study, making up an area of 28,687,362 hectares, equivalent to 22.89%. The Conservation Units and Indigenous Lands added together, are equivalent to about 35% of the State's protected territory (Figure 5-6).

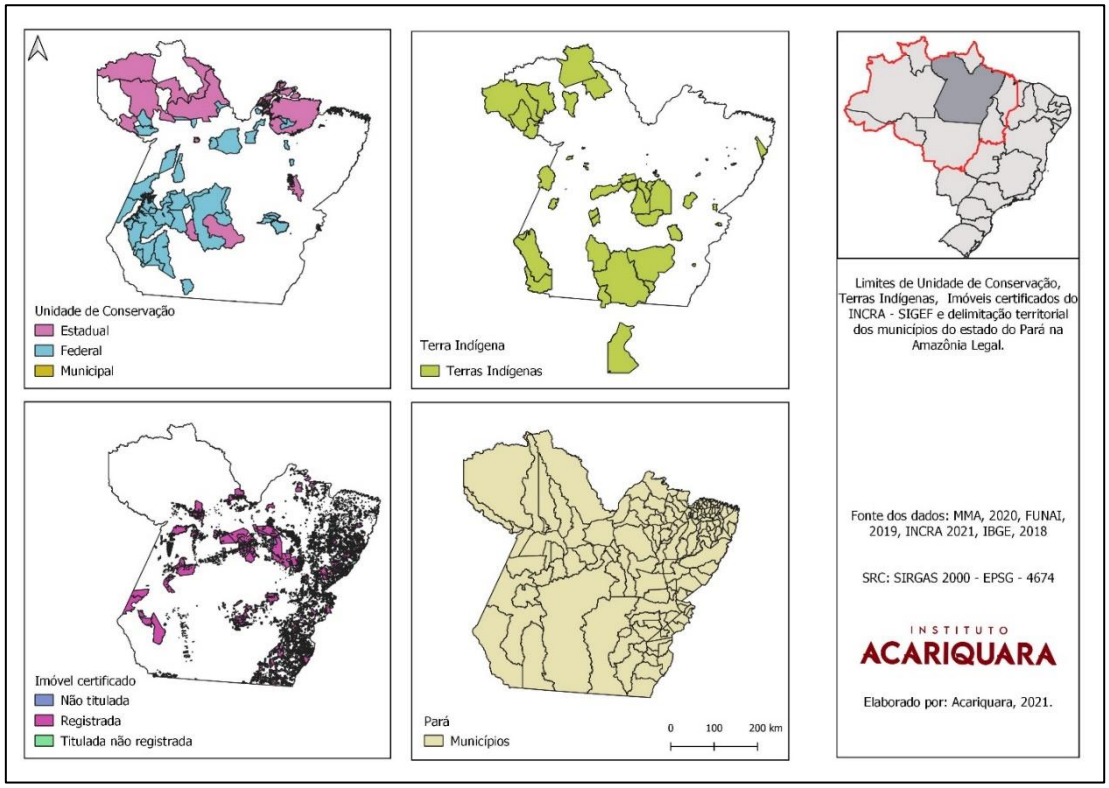


Figure 5-6. Map of conservation units, indigenous lands, INCRA certified properties and territorial delimitation of the stateof Pará.

Regarding land tenure regularization in the state, until 05/31/2021, the database made available by the Land Management System (SIGEF) contained 15,657 certified parcels in the state, totaling 19,266,807.57 hectares, a number corresponding to approximately 13.5% of the territorial extension of the state. Among the municipalities with the highest number of parcels certified by SIGEF-INCRA are Conceição do Araguaia with 622 parcels, Rondon do Pará with 595 parcels and Pacajá with 530 parcels.

Roraima

In relation to the state of Roraima, there are currently 14 conservation units, of which 11 are in the federal domain, 2 in the state domain and 1 in the municipal domain. Together these areas account for about 21.6% of the state's territory. About indigenous lands, the state has 33 regularized lands, making up an area of 10,370,676 hectares, equivalent to 46.2%. The Conservation Units and Indigenous Lands in the state of Roraima, when added together, are equivalent to 67.8% of the protected territory, being the Legal Amazon state with the largest area under direct protection (Figure 5-7).

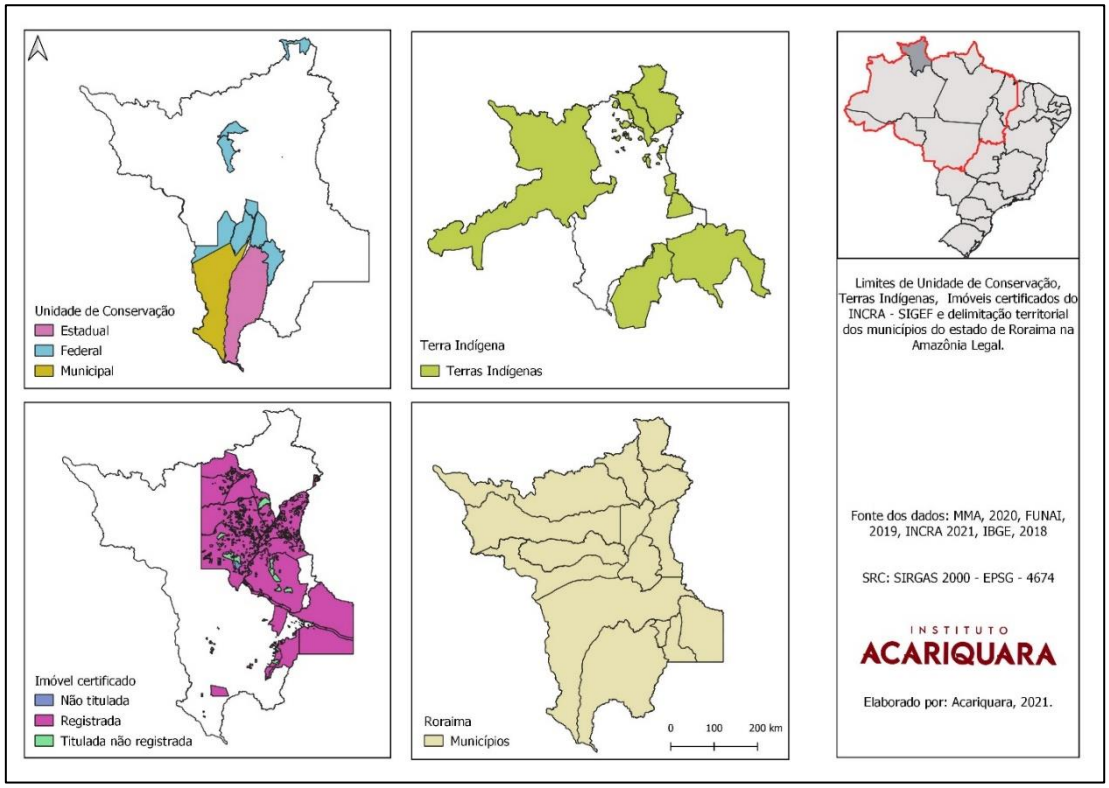


Figure 5-7. Map of conservation units, indigenous lands, INCRA certified properties and territorial delimitation of thestate of Roraima.

Regarding land tenure regularization in the state, until 05/31/2021, the database made available by the Land Management System (SIGEF) contained 3,205 parcels certified in the state, totaling 9,621,031.88 hectares, a number corresponding to approximately 43% of the territorial extension of the state. Among the municipalities with the highest number of parcels certified by SIGEF-INCRA are Rorainópolis with 849 parcels, Cantá with 509 parcels and Boa Vista with 482 parcels.

Rondônia

In relation to the state of Rondônia, there are currently 43 conservation units, of which 31 are under federal authority and 12 under state ownership. About indigenous lands, the state has 23 regularized lands, making up an area of 5,022,789 hectares, equivalent to 21.05% (Figure 5-8).

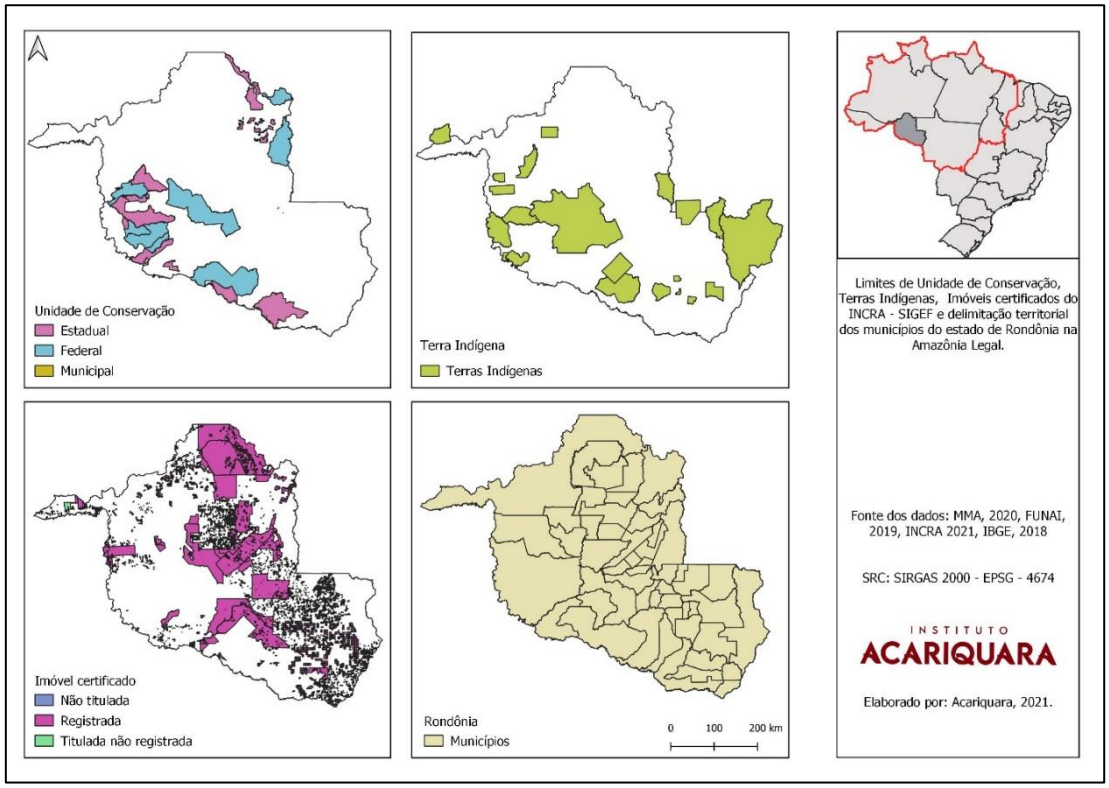


Figure 5-8. Map of conservation units, indigenous lands, INCRA certified properties and territorial delimitation of the stateof Rondônia.

Regarding land tenure regularization in the state, until 05/31/2021, there were 10,300 certified parcels in the state in the database made available by the Land Management System (SIGEF), totaling 6,948,819.59 hectares, a number corresponding to about 25.3% of the territorial extension of the state. Among the municipalities with the highest number of parcels certified by SIGEF-INCRA are Porto Velho with 957 parcels, Ariquemes with 582 parcels and Pimenta Bueno with 532 parcels.

Maranhão

In relation to the state of Maranhão, there are currently 23 conservation units, of which 14 are federal domain and 9 are of state domain. In relation to indigenous lands, the state has 20 lands between declared, delimited and regularized, making up an area of 2,285,329 hectares, equivalent to 8.63% of the protected territory (Figure 5-9

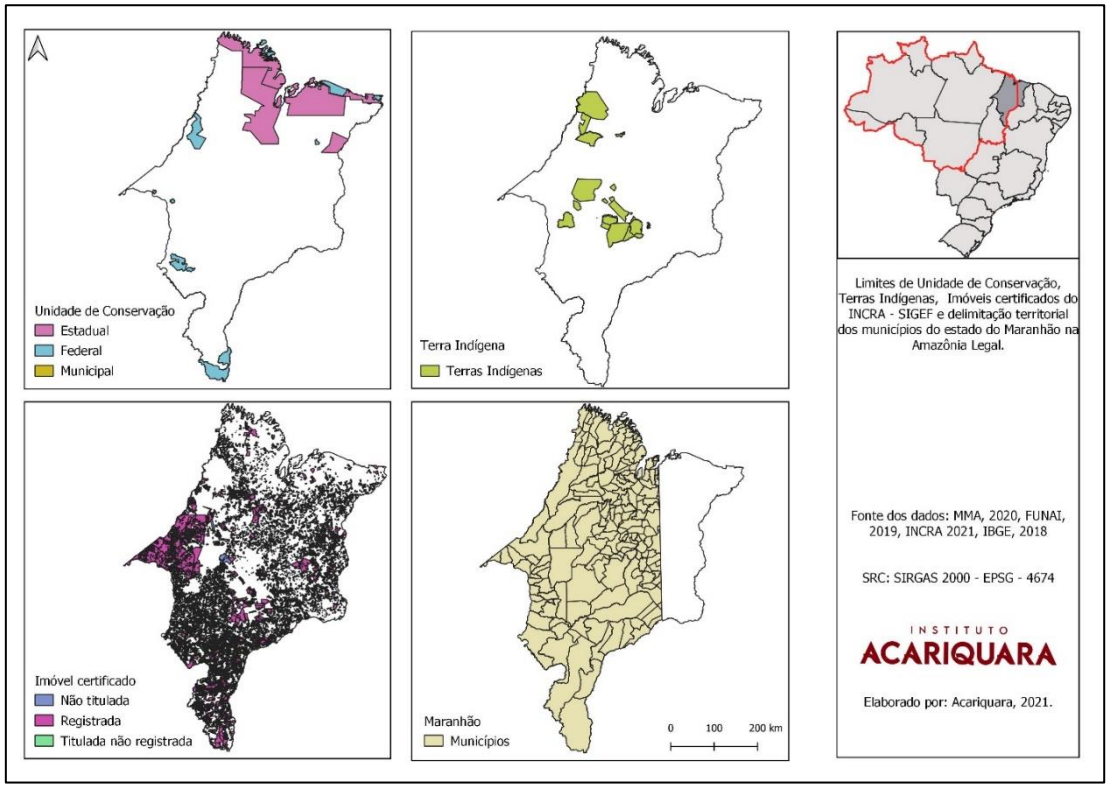


Figure 5-9. Map of conservation units, indigenous lands, INCRA certified properties and territorial delimitation of the stateof Maranhão.

Regarding land tenure regularization in the state, until 05/31/2021, the database provided by the Land Management System (SIGEF) contained 27,541 certified parcels in the state, totaling 10,979,129.42 hectares, a number corresponding to about 33.1% of the territorial extension of the state. Among the municipalities with the highest number of parcels certified by SIGEF-INCRA are Balsas with 2570 parcels, Açailândia with 1207 parcels and Riachão with 1063 parcels.

Tocantins

In relation to the state of Tocantins, there are currently 28 conservation units, of which 11 are federal domain, 16 state domain and 1 municipal domain. Together these areas result in about 4,220,660 hectares, which represents about 15.2% of its territory. About indigenous lands, the state has 11 lands between declared and regularized, comprising an area of 2,285,329 hectares, equivalent to 8.63%. The Conservation Units and Indigenous Lands added together, are equivalent to 23.8% of the State's protected territory (Figure 5-10).

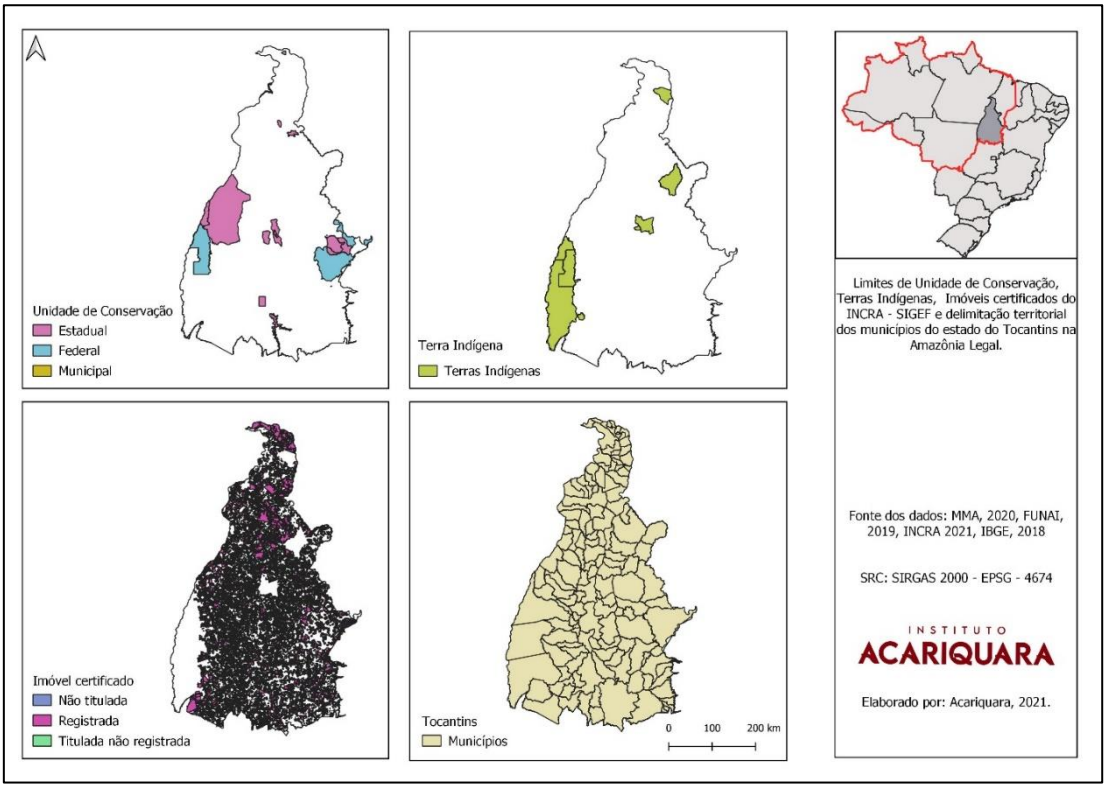


Figure 5-10. Map of conservation units, indigenous lands, INCRA certified properties and territorial delimitation of the state of Tocantins.

5.2 TRANSVERSAL RIGHTS

This dimension is called Transversal Rights because it deals with themes that carry, on the one hand, a strong legal component (Rights: human rights, gender equality and labor conditions) and, on the other hand, are characterized by marked transversality (Transversal). From a normative point of view, it is possible to state that parameters of human rights, gender equality and labor conditions are based on agreements and other international regulations and national legislation, with a large part of these rights enshrined in the Brazilian Federal Constitution and it can be said that in certain respects they correspond to a set of fundamental rights14[15].

Regarding the transversality of the 3 themes involved in this dimension, it is emphasized that these are matters of concern at all stages of the Floresta+ Pilot Project, from planning to its mechanisms and implementation processes, as well as its monitoring and evaluation. Furthermore, the Transversal Rights dimension also permeates other themes, such as indigenous peoples and traditional communities, access to natural resources and economic displacement. It is noted that the emergence of new socio-environmental demands and the way they take on the public and governmental agenda require complex and cross-cutting responses for public agents, whether Government, international or those directly linked to local communities[16].

From a normative point of view, both international and national, the main documents used to analyse the Transversal Rights Dimension are listed in Table 5-6.

[15] Regarding fundamental rights in the human rights phase, it is clarified that the first are expressly in a national domestic legal order (Cabrita, 2011:38), which is why we mentioned the Brazilian Federal Constitution; in turn, human rights can be seen in a broader perspective and originating in the international arena, as a set of internationally agreed values and principles under the influence of a "boomerang effect" with local agendas (Risse & Sikkink, 1999: 18-19).

[16] In this regard, see: Silva, T.D., Gestão da Transversalidade em Políticas Públicas, XXXV ANPAD Meeting, Rio de Janeiro, 2011

Table 5-6. Main documents that constitute the normative basis, international and national, of the Transversal RightsDimension (Source: elaborated by the authors).

MAIN INTERNATIONAL PROTOCOLS AND LANDMARKS RATIFIED BY BRAZIL	
Universal Declaration of Human Rights International Agreement on Civil and Political Rights and optional protocols International Agreement on Economic, Social and Cultural Rights and optional protocol Convention on the Elimination of All Forms of Discrimination against Women and Optional Protocol Vienna Declaration and Program of Action Inter-American Convention to Prevent, Punish and Eradicate Violence against Women "Convention of Belém do Pará" 1995 Beijing Declaration and Platform for Action Declaration of the Rights of Indigenous Peoples International Convention on the Elimination of All Forms of Racial Discrimination International Convention on the Rights of the Child Convention on the Rights of Persons with Disabilities International Labor Organization Convention No. 29 on Forced or Compulsory Labor Convention No. 105 also on the Abolition of Forced Labor of the International Labor Organization International Labor Organization Convention No. 169 on Indigenous and Tribal Peoples 2030 Agenda, with its Sustainable Development Goals	
FEDERAL CONSTITUTION AND NATIONAL LEGISLATION	
Brazilian constitution	Article 3 of the Brazilian Constitution declares that the fundamental objectivesof the Federative Republic of Brazil are: 1) to build a free, fair and solidary society; 2) ensure national development; 3) eradicate poverty and marginalization and reduce social and regional inequalities; and 4) promote the wellness of all, without prejudice based on origin, race, sex, color, age and any other forms of discrimination. Articles 5, 225 and 231
Labor laws	Article 1 of the Consolidation of Labor Laws (CLT) of Brazil establishes that it is prohibited to adopt discriminatory practices and with the objective of limiting access to the employment relationship or its maintenance based on sex, origin,race, color, marital status, family status or age, except in cases of child protection provided for in paragraph XXXIII of art. 7 of the Federal Constitution.
Law No. 13,112/2015, of March 30, 2015.	Allows the woman, under equal conditions, to register the birth of her child.
"Femicide Law" - Law No. 13,104/2015, of March 9, 2015.	Imposes harsher penalties for those who attack or kill women or girls because of their gender
“Maria da Penha Law” – Law No.11,340/2006, of August 7, 20)	Aims to reduce domestic violence against women. The law speeds up courtorders in cases of domestic violence, in addition to imposing more severe penalties on aggressors.
Decree No. 6,040, of February 7, 2007	Constitutes the National Policy for the Sustainable Development of Traditional Peoples and Communities (PNPCT)

5.2.1 Human Rights

Human rights are central to sustainable development, the fight against poverty, peace and a fair distribution of development opportunities and benefits, following the UNDP Social and Environmental Standards (SES), which are based on a “Human Rights Based Approach” (HRBA)[17]. The HRBA is based on the Universal Declaration of Human Rights and other United Nations human rights instruments and mechanisms, including normative international agreements and others such as the Universal Periodic Review and Special Rapporteurs, not supporting activities that contribute to any violations of human rights.

The following human rights standards are named: accountability (assumption of responsibility, accountability); the rule of law; participation and inclusion, with the participation having to be meaningful, effective and informed by stakeholders in the formulation, implementation, monitoring and evaluation of programs and projects; and equality and non-discrimination by race, ethnicity, sex, age, language, disability, sexual orientation, gender identity, religion, political or other opinion, national or social or geographic origin, wealth, birth, health status or other status, as an indigenous person or as a member of a minority (SES, p. 7, January 2021).

[17] Available from: https://unsdg.un.org/2030-agenda/universal-values/human-rights-based-approach.

The first Risk presented in the ESMF (2021) is related to human rights, and this fundamentally enunciates the concern that injustice and discrimination will not occur against indigenous peoples, traditional peoples and communities, marginalized groups and people living in poverty in the territory covered by the Floresta+ Pilot Project. This means maintaining a human rights approach at all stages of the project, striving for equal rights and opportunities in the selection of beneficiaries.

Normative scope - international and national

An approach of respect for human rights aimed at the implementation of development programs and projects should primarily consider the rights listed in the Universal Declaration of Human Rights (UDHR) [18] and complementary normative documents, as well as the rights reaffirmed by the Federal Constitution of Brazil (highlight for articles 5, 225 and 231), with a focus on indigenous peoples and local traditional communities that are recognized as the main protagonists for the environmental sustainability of the territories in question and must be understood as subjects of these human rights.

In addition to the Universal Declaration of Human Rights, the Agreement on Civil and Political Rights and the Agreement on Economic, Social and Cultural Rights and their optional protocols make up the central core of Human Rights in the international sphere, followed by other important United Nations documents that complement and expand the scope of what are considered Human Rights, such as the Vienna Declaration and Program of Action [19] and the 2030 Agenda, with its Sustainable Development Goals [20]. Other relevant international documents to consider are the United Nations Declaration on Indigenous Peoples [21] and the International Labor Organization (ILO) Convention 169 on Indigenous and Tribal Peoples [22].

Going into the issues and themes that concur to describe the guarantee of civil rights, it is important to know the land issues (related to the right to property and its socio-environmental function), which involve rural ownership and property, land regularization, land demarcation. As for social rights, those dependent on institutional and governmental capacity stand out, namely, access to essential public services by the local population, such as civil registration of birth, health and education, banks, among others. As for political rights, the importance of access to information, participation in political decision-making and in community life and in individual freedom is emphasized, as well as the right to free peaceful association, which is directly related to the principle of non-violence. Still, to have non-violence strategies, it is necessary to look at public safety indicators, which portray human rights such as the right to physical integrity and the right to life.

Municipal Human Development Index

The Municipal Human Development Index (MHDI)[23] of the Legal Amazon[24] is 0.73, lower than the national value which is 0.78. Since the MHDI can be subdivided into three dimensions – income, education and longevity – it appears that in all dimensions the Amazon MHDI is lower than the national one, as can be seen in Table 5-7.

[18] Available from: https://brasil.un.org/pt-br/91601-declaracao-universal-dos-direitos-humanos
[19] Available from: https://www.onumulheres.org.br/wp-content/uploads/2013/03/declaracao_viena.pdf
[20] Available from: https://brasil.un.org/pt-br/sdgs
[21] Available from: https://www.acnur.org/fileadmin/Documentos/portugues/BDL/Declaracao_das_Nacoes_Unidas_sobre_os_Direitos_dos_Povos_Indigenas.pdf
[22] Available from: https://www.ilo.org/wcmsp5/groups/public/@ed_norm/@normes/documents/publication/wcms_100907.pdf
[23] The Municipal Human Development Index (MHDI), established by the UNDP, is composed of indicators of three dimensions of human development: longevity, education and income. The index value ranges from 0 to 1, and the closer to 1, the greater the municipal human development. https://www.br.undp.org/content/brazil/pt/home/idh0/atlas-do-desenvolvimento-humano/atlas-dos-municipios.html.

[24] The results considered the average of the MHDI of the states of the Legal Amazon, including the state of Maranhão as a whole.

Most municipalities in the region are within the MHDI[25] ranges medium (47%) or low (43%), 10% of the municipalities have MHDI considered high, and the Brazilian Amazon does not have any municipality whose MHDI is considered very high[26].

Table 5-7. Municipal Human Development Index comparison Amazon and Brazil. Source: adapted from Atlas of Human Development (2019). * It was considered as the median of the MHDI of the states in the region.

Variable	Amazônia*	Brazil
MHDI 2017	0.73	0.78
MHDI Income	0.70	0.75
MHDI Longevity	0.80	0.85
MHDI Education	0.72	0.74

Considering the disaggregation into dimensions of the MHDI for Amazonian states, a relative high performance is noted in the income dimension and lower performances when the subjects are education and longevity, as systematized in Table 5-8 below.

Table 5-8. MHDI and its dimensions for the states of the Legal Amazon. Source: http://www.atlasbrasil.org.br/ranking.

States	MHDI	MHDI Income	MHDI Education	MHDI Longevity
Rondônia	0.725	0.776	0.703	0.699
Acre	0.719	0.821	0.682	0.664
Amazonas	0.733	0.786	0.735	0.682
Roraima	0.752	0.781	0.771	0.706
Pará	0.698	0.788	0.661	0.654
Amapá	0.740	0.820	0.710	0.695
Tocantins	0.743	0.811	0.727	0.696
Mato Grosso	0.774	0.825	0.758	0.742
Maranhão	0.687	0.764	0.682	0.623

Institutional and governance capacity

Institutional capacity is the structuring basis for public policies in a human rights approach. In addition to the international and domestic normative framework framed above, this capacity comprises public institutions (from the three federative spheres) with specialized attributions, their human, budgetary and infrastructure resources, as well as private institutions with public interest activities such as banks, unions and non-governmental organizations and others that, in the case of this study, carry out socio-environmental activities related to the scope of the Floresta+ Pilot Project.

Not exhaustively, the main public institutions that work in the promotion and protection of human rights in this study, in the Legal Amazon, are cited: National Institute for Colonization and Agrarian Reform (INCRA)[27], Superintendence for the Development of the Amazon (SUDAM)[28], Federal Public Ministry - 6th Coordination

[25] The five ranges considered are: very low (0.000 – 0.499), low (0.500 – 0.599), medium (0.600 – 0.699), high (0.700 – 0.799) and very high (0.800 – 1.000).
[26] Information available from SUDAM: http://repositorio.sudam.gov.br/sudam/biblioteca/publicacoes-institucionais/sintese-de-indicadores-da-amzonia-legal-2020.pdf.
[27] Available from: https://www.gov.br/incra/pt-br
[28] Available from: https://legislacao.presidencia.gov.br/atos/?tipo=LCP&numero=124&ano=2007&ato=ce1k3YU1ENRpWT819.

and Review Chamber[29] and National Indian Foundation (FUNAI)[30]; in addition to other institutions such as the Ministry of Women, Family and Human Rights and possible similar bodies at state and municipal levels. Furthermore, the bodies of the Judiciary and Public Security, which have missions of access to justice, due legal process, inspection and accountability, useful in the resolution and mitigation of conflicts, can be added to the set of institutional actors.

Institutional and governance capacity is fundamental for the exercise of citizenship and access to human rights by local populations. Along the other dimensions that follow in this analysis, other institutions are addressed, their strengths and weaknesses, having implications on issues such as gender equality, decent labor conditions, indigenous peoples and traditional communities, family farmers, access to public services, tenure regularization, access to CAR, innovation and technology, among other aspects.

Public safety and conflicts

One of the important human rights principles used by UNDP at SES is the one which refers to peace and non-violence. Therefore, it is relevant to analyze information on conflicts and public safety, which are also related to issues of land title in the Legal Amazon. The security of land tenure, or lack of it, has led to a historical process of land grabbing, being a source of deforestation, predatory exploitation of natural resources and violence in the countryside, which has intensified in recent years (Azevedo Ramos et al., 2020). The lack of definition of use, ownership and governance of about 49.8 million hectares of public forests in the Amazon (NDPF – Non-Destined Public Forest), which are awaiting a decision by the government – federal or state – about what they are and to whom they belong, leaves these areas even more vulnerable to invasion or land grabbing. According to the recent study "Terra sem lei na terra de ninguém: as florestas públicas não destinadas na Amazônia brasileira" (Azevedo-Ramos et al., 2020), 23% of these hectares were taken by land grabbers (11.6 million hectares) and 2.6 million hectares (Mha) deforested from 1997 to 2018.

The IPEA study, called Atlas of Violence[31], presents data from 2018 on violence in Brazil and concludes on the high rates of homicides[32] in the states of the Legal Amazon. The states of Roraima, Amapá and Pará have homicide rates between 49 and 71.9 per 100 thousand inhabitants, being among the most violent according to this indicator. Acre is in the range between 39 and 48.9 homicides per 100,000 inhabitants. All other Amazonian states are in the range of homicide rates between 25 and 38.9 per 100,000 inhabitants. This information is depicted in Figure 5-11.

[29] 6th Chamber of Coordination and Review of the Federal Public Ministry "exercises the role, within the scope of the MPF, of coordinating, integrating and reviewing institutional actions aimed at protecting the indigenous population and traditional communities. "It is incumbent upon it to act in civil proceedings relating to the defense of the rights and interests of indigenous populations and those related to traditional communities" (Resolution CSMPF No. 148, art. 2, § 6, of 4/1/2014), with emphasis for thefollowing areas of activity: Gypsies; extractivist communities; riverside communities; indigenous peoples; quilombolas. The main challenge for prosecutors working on these themes is to ensure the plurality of the Brazilian State from an ethnic and cultural perspective, as determined by the Brazilian Constitution". Available from: http://www.mpf.mp.br/atuacao-tematica/ccr6/sobre.

[30] FUNAI is a government agency and has units called Ethnoenvironmental Protection Fronts (FPE). Available from: https://www.gov.br/funai/pt-br

[31] Available from: https://www.ipea.gov.br/portal/images/stories/PDFs/relatorio_institucional/200826_ri_atlas_da_violencia.pdf

[32] Homicide rates are calculated per 100,000 inhabitants, taking the victims' place of residence as the territorial base.

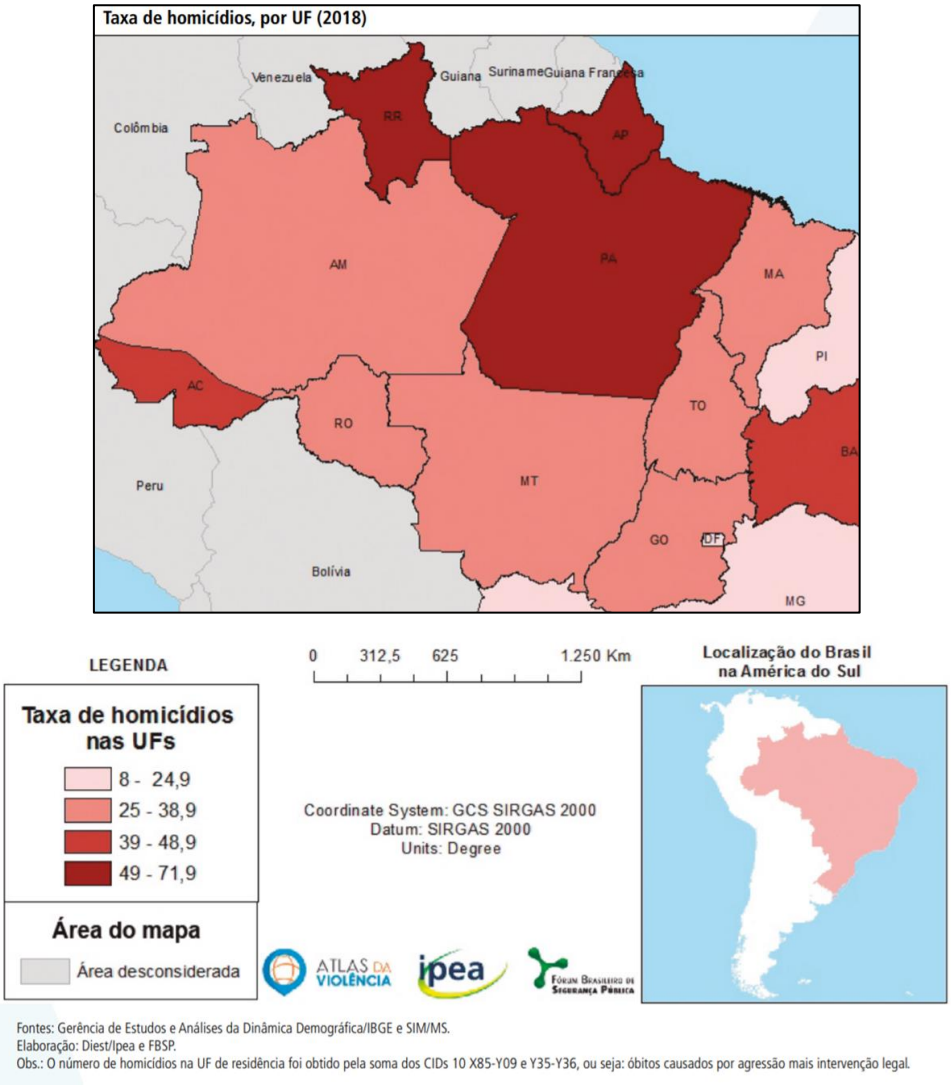


Figure 5-11. Homicide rate per 100,000 inhabitants, in the states (federal units) of the Legal Amazon, by place ofresidence of victims

https://www.ipea.gov.br/portal/images/stories/PDFs/relatorio_institucional/200826_ri_atlas_da_violencia.pdf (p. 14)

The study also points to a significant increase in homicide rates in most states in the Legal Amazon between the years 2008 and 2018, with only a decrease in the homicide rate in the states of Rondônia and Mato Grosso, and there was an expressive increase on the number of homicides in the state of Roraima (greater than 51%)[33]

5.2.2 Gender Equality

A critical and fundamental point for human rights is gender equality. The United Nations Charter, of 1945, the founding document of the international organization, presents in its preamble the importance of promoting equal rights between men and women to consolidate a more just society. In line with the aforementioned general and subsequent international document, within the scope of United Nations bodies, UNDP has a Gender Equality Strategy, currently in its third update for the 2018-2021 triennium. This strategy recognizes gender equality as a basic human right and a structuring component for sustainable development policies, establishing areas of attention to overcome legal, social and economic inequalities and ensure the empowerment of women

[33] It is possible to see the map of the annual variation of the homicide rate in the states of Brazil, from 2008 to 2018, in the Atlas of Violence, on page 15 of the study, available from https://www.ipea.gov.br/portal/images/stories/PDFs/relatorio_institucional/200826_ri_atlas_da_violencia.pdf

and girls in contemporary society. UNDP's 2018-21 Gender Equality Strategy must be respected in the programs and projects implemented by the organization, to collaborate with the achievement of Sustainable Development Goal number 5. Thus, UNDP is committed, through said strategy, to promote the participation and protagonism of women, not considering them only as beneficiaries of projects, to strengthen the gender mainstreaming in the projects, among other measures, which should, therefore, be coordinated in the Floresta+ Amazônia Pilot Project. Therefore, this study of environmental and social impact in the gender component is so important.

The Green Climate Fund (GCF) recognizes the central importance of gender considerations in terms of impact and access to climate finance, and requires that a Gender Assessment be presented as part of the funding proposals it evaluates (IDAD, 2021). The main objective of the Gender Assessment is to examine the gender aspects of the project and subsequently strengthen gender-sensitive actions in all phases of the project.

The characterization was based on data available from official statistics, studies carried out by the Government of Brazil, and by international agencies such as the United Nations (UN), World Economic Forum and the Organization for Economic Cooperation and Development (OECD).

National institutional framework for promoting gender equality

Brazil has ratified and/or signed many international conventions, treaties and plans of action on gender equality, women's empowerment and human rights, the most important of which are shown in Table 5-9 at the beginning of the chapter. Under the current Ministry of Women, Family and Human Rights (MMFDH), the National Secretariat for Women's Policies (SNPM) is responsible for the formulation, coordination and articulation of public policies for women.

The National Council for Women's Rights (CNDM), created in 1985 by the Ministry of Justice, includes representatives from other areas of government and civil society and since 2018 is composed of 15 members from various federal government departments, 14 Feminist Networks and Articulations and Networks for the Defense of Women's Rights, 7 Union, Associative, Professional or Class Organizations. The Council formulates guidelines for the promotion of women's rights and implements gender-related policies.

Table 5-9. Main national policies, plans and programs for the promotion of gender equality in Brazil.

NATIONAL POLICIES, PLANS AND PROGRAMS	
National Plan to Combat Femicide – PNEF	set of actions and goals intended to implement integrated and articulated public policies throughout the national territory.
Safe and Protected Women Program (Instituted by Decree No.8,086, of August 30, 2013, and amended by Decree No. 10,112 of November 12, 2019)	to integrate and expand existing public services aimed at women in situations of violence, through the articulation of specialized care in the areas of health, justice, the social assistance network and the promotion of financial autonomy.
Qualifica Mulher Pilot Project (established by Ordinance No. 3175, of December 10, 2020, and amended by Ordinance No. 595, of February 19, 2021)	purpose of encouraging actions that promote women's economic autonomy in contributing to the country's economic and social development. The project aims to form a network of partnerships with federal, state, district and municipal public authorities, private entities and institutions, to promote actions of professional qualification, work and entrepreneurship, to generate employment and income for women in situations of social vulnerability.
More Women in Power Project (Instituted by Ordinance 2027, of August 26, 2020)	awareness strategy on the political participation of women in elective, power and decision-making positions, as well as the full exercise of representative and participatory democracy, whose target audience is pre-candidate women and women interested in knowing and participating more actively in the Brazilian political environment

NATIONAL POLICIES, PLANS AND PROGRAMS	
"Girls in Exact Sciences, Engineering and Computing" Program	results from a partnership signed between the National Secretariat for Policies for Women, the Secretariat of Basic Education of the Ministry of Education and the Ministry of Science, Technology, Innovation and Communications, to combat dropout, which occurs mainly in the early years, of female students of undergraduate courses in these areas.
Permanent National Forum to Combat Violence against Rural and Forest Women and State Forums	discusses, formulates and implements public policies to combat violence against women living in the countryside and in the forest. Composed of representatives of the government and civil society, the State Forums for Combating Violence against Women in the Countryside and Forest, created in 2013, promote joint action in combating violence against women, in light of national guidelines, leading to taking into account local and regional specificities.

Table 5-10. Main national institutions for the promotion of gender equality in Brazil.

MAIN INSTITUTIONS	
National Secretariat of Policies for Women (SNPM) of the Ministry of Women, Family and Human Rights (MMFDH)	Is responsible for the formulation, coordination and articulation of national public policies for women.
The National Council for Women'sRights (CNDM)	It integrates the structure of the MMFDH and has as one of its important duties to support the SNPM. It formulates guidelines for the promotion of women's rights and implements gender-related policies, in articulation with various institutions of the Federal Public Administration and with civil society.

Dynamics and gender inequality at the national level, compared to other countries

Over the past two decades, Brazil has made important advances in promoting gender equality in the country, taking concrete steps to promote and more comprehensively integrate gender equality into the public policy-making agenda, and achieved substantial advances, especially in areas such as education. and health, as well as on the condition of equality before the law. Brazilian women currently surpass men in several education indicators (ESMF, 2021). Progress has been weaker, however, in the areas of women's political empowerment and economic opportunities, particularly in outcomes related to women's economic opportunities and acting (the ability to make decisions and take control of life projects) (ESMF, 2021). Furthermore, national advances often mask racial or geographic disparities in all dimensions of gender equality. This means that even in areas where progress has been made, large groups of women may be being left behind because of their racial, ethnic or geographic identities (ESMF, 2021). Women tend to be more affected by wage inequality, higher poverty and over-represented in the informal and care economy (ILO, 2020). Existing gender dynamics can be detrimental to men as well. The continuing incidence of poor academic performance among men (specifically black/dark-skinned) has negative implications for development (ESMF, 2021).

In this sense, the most recent results of the UNDP, World Economic Forum and OECD international composite indices, which attempt to assess and quantify gender inequalities in several countries, shown in Table 5-11, reveal a more fragile position of Brazil on issues such as political empowerment and labor market and stronger in themes such as education and health.

Table 5-11. Composite indices regarding gender equality in Brazil compared to global information

Index	Value/ Year	World Ranking Position	what it measures	Source	Link

Gender Development Index (GDI)	0.993 (2019) (World Average: 0,943)	84th among 162 countries	The GDI considers gender differences in human development between menand women.	UNDP (United Nations Development Programme)	http://hdr.undp.org/en/indicators/137906
Gender Inequality Index (GII)	0.408 (2019) (World Average: 0.436)	95th among 162 countries	The GII covers inequality between women and men in terms of reproductive health,empowerment and the labor market, and assesses human development in three areas: health, education and command over economic resources.	UNDP (United Nations Development Programme)	http://hdr.undp.org/en/indicators/68606
Global Gender Inequality Index (GGGI)	0.695 (2021) (World Average: 0,677)	93rd among 156 countries; 25th among 26 countries from Latin America and the Caribean	It examines the gender gap infour categories: economic participation and opportunity, education, health and survival; and political empowerment	World Economic Forum	https://www.weforum.org/reports/global-gender-gap- report-2021
Sub-Indices:					
Economic participation and opportunity	0.665	89th			
Education level	1,000	37th			
Health and survival	0.980	1st			
Political empowerment	0.138	108th			
Social Institutions andGender Index (SIGI)	21.2% (low discrimination against women)(2019)	38th among 120 countries	Composite index with 14 indicators of 5 sub-indices: Discriminatory family law, restricted physical integrity,gender bias, restricted resources and goods and restricted civil liberties to measure discrimination against women in social institutions	Organization forEconomic Cooperation and Development (OECD)	https://www.genderindex.org/wp-content/uploads/files/datasheets/2019/BR.pdf

In the recent IBGE study (2021) on women's social indicators in Brazil, Figure 5-12 stands out, which illustrates, at national level, the lower rate of participation of women in the labor force (54.5%), especially for women with children, the low percentage in management positions (37.4%) or in public life as councilors (16%), but a better position in education and health data.

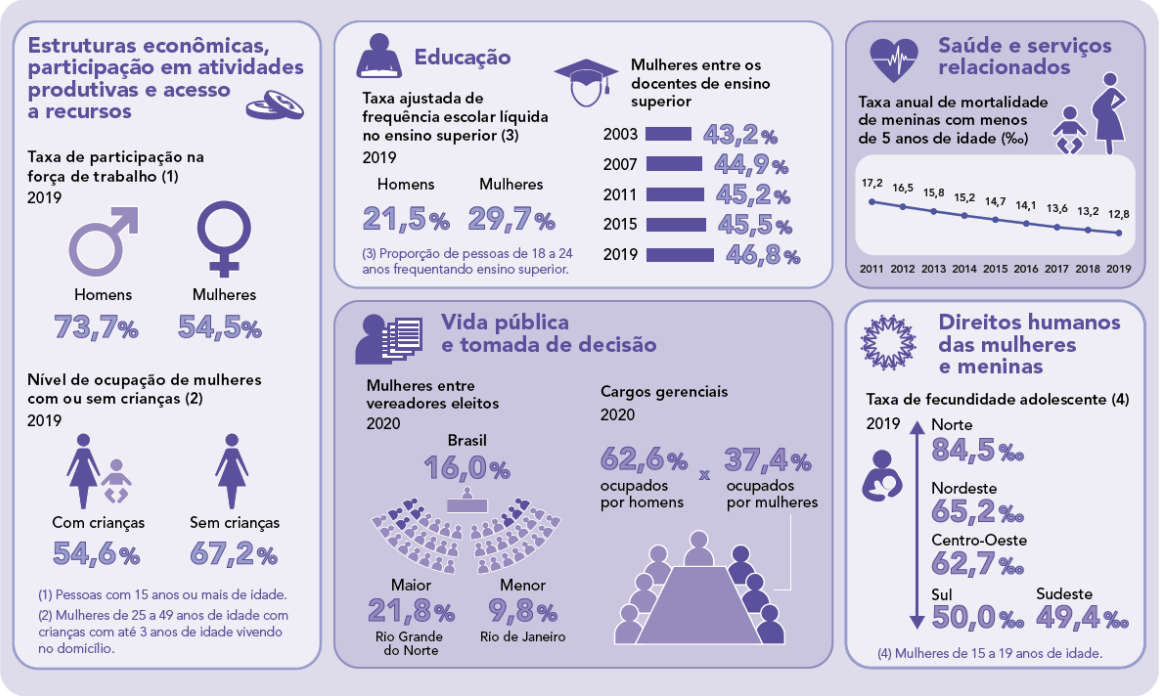


Figure 5-12. Fundamental information from the 2nd edition of the study Gender statistics: social indicators of women in Brazil, by IBGE. Source: IBGE (2021).

Political Participation and Decision Making

This aspect is closely related to the analysis of "labor conditions", on which it is essential to understand the specifics of women's labor conditions in the Amazon region. The participation and political representation of women is still very weak in Brazil and has not changed much in recent decades. Brazil is one of the few countries in the Latin American region that had a female president, which represented some advance in terms of women's participation at the ministerial level. Still, women were often appointed to portfolios that were not as highly valued in terms of critical decisions for the country, in areas such as human rights, racial equality and women's policies. On September 25, 2020, of the 22 ministers of state, only two were women, or 7.1% (IBGE, 2021).

There has been a recent change in the Brazilian electoral code, which now requires that at least 30% of political party candidates be women and that at least 5% of financial resources be allocated to promoting female political participation and meeting this quota. As a result, the number of candidates in the 2014 general election increased by 47% compared to the 2010 elections. In 2018 this number of women who ran for elected office in the General Elections was 9,204. However, the election itself did not significantly alter the gender composition of the legislative bodies. In 2010, 45 women were elected to the Chamber of Deputies; in 2014, 51 candidates took office; by 2018 this number had risen to 77 women (15% of seats).

Regional differences in the Legal Amazon are also large, with percentages ranging from 50% of seats in the Chamber of Deputies occupied by women in the state of Acre, to 0% in the states of Amazonas and Maranhão. At the state level, leadership roles are equally dominated by men, with only one female governor elected in the last two elections of this federative sphere (in 2014 and 2018). In 2016, of the 8,634 seats available in the City Council, only 1,280 are women (14.8%), with a maximum of 18.2% women in the state of Amapá and a minimum of 10.6% in Rondônia. In 2020, the number of elected councilors increased, but it is still only 16%.

Of the UN 2030 Agenda monitoring indicators associated with the SDG5 (Gender Equality), the low proportion of seats occupied by women in (a) national parliaments and (b) local governments stands out, Table 5-12.

Table 5-12UN 2030 Agenda Indicator: 5.5.1.a - Proportion of seats held by elected women in national and state parliaments. Source: https://odsbrasil.gov.br/objetivo5/indicador551#.

Chamber of Deputies (2018)			
	No. of seats (Total)	No. of seats occupied by women	Proportion of seats occupied by women
Brasil	**513**	**77**	**15**
Rondônia	8	3	37.5
Acre	8	4	50
Amazonas	8	-	-
Roraima	8	2	25
Pará	17	1	5.9
Amapá	8	3	37.5
Tocantins	8	2	25
Maranhão	18	-	-
Mato Grosso	8	1	12.5
Chamber of Councilors (2016)			
	No. of seats (Total)	No. of seats occupied by women	Proportion of seats occupied by women
Rondônia	529	56	10.6
Acre	229	31	13.5
Amazonas	722	95	13.2
Roraima	153	20	13.1
Pará	1 734	240	13.8
Amapá	170	31	18.2
Tocantins	1 299	203	15.6
Maranhão	2 394	415	17.3
Mato Grosso	1 404	189	13.5

Under-representation also materializes at the local government level. In 2020, only 16.0% of elected councilors were women and only 12% of mayors elected in the 1st round of the 2020 Elections are women[34]. There was an increase of less than 3 percentage points compared to 2016 (IBGE, 2021).

It should be noted that black women and dark-skinned women were under-represented among elected women. Although they represented, respectively, 9.2% and 46.2% of women in the population in 2019, they reached 5.3% and 33.8% of the seats in the town councils obtained by women in the 2020 elections (IBGE, 2021).

Education and Health

Available data indicate that Brazilian women are, on average, more educated than men. The Continuous National Household Sample Survey revealed that, in 2019, among the population aged 25 and over, 40.4% of men had no education or had only incomplete elementary school, a proportion that was 37.1% among women. The proportion of people with a university degree was 15.1% among men and 19.4% among women (IGBE, 2021). However, among the population aged 65 and over, the opposite occurs: women had a slightly lower level

[34] Available from: https://www.tse.jus.br/imprensa/noticias-tse/2020/Novembro/mulheres-representam-apenas-12-dos-prefeitos- eleitos-no-1o-turno-das-eleicoes-2020

of education than men, revealing the restrictions faced by them in accessing education in past decades. In the other age groups, women were more educated than men, with a greater difference in the younger population.

In the group between 25 and 34 years, 25.1% of women had completed higher education, against 18.3% of men, a difference of 6.8 percentage points (IBGE, 2021).

Although male and female children and youngsters register gross school attendance rates (which considers attendance at any level of education) similar in each age group, it is noted that women obtain considerably better rates than men in the Adjusted net school attendance rate (which considers attendance only at the level of education appropriate to the age group or the completion of this stage) (IBGE, 2021). In the early years of elementary school, both sexes registered the same rate (95.8%), but in the following stages women began to register rates higher than those of men, with a difference that widens until reaching its maximum level in higher education – in which women recorded a rate of 29.7%, against 21.5% of men, which can be explained by the higher occurrence of school backwardness among men (IBGE, 2021).

Even so, the inequalities are manifested in the fact that in 2019, black or dark-skinned women between 18 and 24 years old had an adjusted rate of net attendance to higher education of 22.3%, almost 50% lower than that recorded among white women (40.9%) and almost 30% lower than the rate found among white men (30.5%). The lowest adjusted rate of net school attendance was found among black or dark-skinned men (15.7%). In certain areas of knowledge, notably those more linked to exact sciences and the sphere of production, the presence of women is low (for example 13.3% of enrollments in Computer and Information Technologies courses or 21.6% in the Engineering area and related professions). In the areas of Wellness, which includes courses such as Social Service, female participation in enrollment was 88.3% in 2019 (IBGE, 2021).

Regarding Health, in Brazil, the maternal mortality rate fell from 120 per 100,000 live births in 1990 to 69 in 2013 and 59.1 in 2018. Currently, 98% of births are attended by qualified personnel, in comparison with 88% in the mid-1990s. Between 2011 and 2019, the reduction in the annual mortality rate of children under 5 years of age in Brazil suggests an improvement in health conditions in early childhood. Among boys, the probability of death increased from 20.6 in every 1,000 live births in 2011 to 15.1 in every 1,000 live births in 2019. Among girls, the indicator rose from 17.2 to 12. 8, in every 1,000 live births (IBGE, 2021). On the other hand, marked regional inequalities persist. While in the Northern Region a girl born in 2019 had a 17.2‰ chance of dying under the age of 5, in the Southern Region, the chances were 9.0‰.

Obesity, a phenomenon observed around the world and especially in low- and middle-income countries such as Brazil, grew between 2013 and 2019. It affected 17.5% of men and 25.2% of women aged at least 20 years of age, in 2013, and reached 22.8% among men and 30.2% of women in 2019. Women aged 18 years or over were more overweight and were more insufficiently active than men (IBGE, 2021).

Regarding elderly women, their life expectancy at age 60 was higher than that of men and increased between 2011 and 2019. In 2011, the life expectancy of a 60-year-old woman in Brazil was 23.1 years and changed to

24.4 in 2019. For men, it rose from 19.6 to 20.7 years (IBGE, 2021). On the other hand, the specific fertility rate for women aged 15 to 19 years old, in 2019, was 59.0 births per 1,000 women aged 15 to 19 years old. In 2011, the rate was 64.0 (IBGE, 2021). Regional disparities are also large, with the state of Amazonas having the highest adolescent fertility rate (93,2)[35].

Participation in the Labor Force

[35] IBGE (2021).

The participation of women in the labor force and in employment has increased only slightly in the last 20 years, from a rate of 54% in 1995 to 59% in 2014. The latest IBGE data (IBGE, 2019)[36] estimate that the employed population from 25 to 49 years old totaled 56.4 million people in Brazil in 2018 and that was composed of 54.7% men and 45.3% women. These estimates have not shown significant changes since 2012, showing the predominance of male participation in the contingent of employed persons. Traditionally, labor market monitoring indicators reveal significant inequalities between men and women (IGBE, 2021).

Large differences in hours worked as paid work and household chores are also present between men and women. In Brazil, women tend to spend, on average, 11.8 hours a day doing housework, more than double the time that men spend, of 5.3 hours a day (Table 5-13). In addition, in 2018, the average value of the hour worked was R$ 13.0 for women and R$ 14.2 for men, indicating that the value of women's income represented 91.5% of that received by men (IBGE, 2019).

Table 5-13. Proportion of daily hours dedicated to caring for people and/or household chores, of people aged 14 or over, by sex and age group. Source: https://odsbrasil.gov.br/objetivo5/indicador541#

Brazil, States of Legal Amazon	Proportion of daily hours dedicated to caring for people and/or household chores, of people aged 14 or over, by sex and age group									
	Total		14 to 29 years old		30 to 49 years old		50 to 59 years old		60 years old or above	
	M	W	M	W	M	W	M	W	M	W
Brazil	5.3	11.8	4	9.3	5.8	13.1	5.7	13.5	5.8	11.7
Rondônia	5.5	11.6	4.7	10.5	5.8	12.4	6.5	13.2	5.6	10.4
Acre	5.6	11.6	5	10.6	6.1	12.4	6.3	13.3	5.6	10.2
Amazonas	4.9	9.4	4.2	8.5	5.2	10.1	5.6	10.1	5.2	9
Roraima	5.2	10.2	4,5	8.7	5.8	11.6	5.9	11.8	5.2	8.8
Pará	5.4	12.5	4.3	10.7	5.9	14.3	5.9	14	6.1	10.9
Amapá	6.4	9.6	5.7	8.3	7	10.8	6.8	10.5	6.1	9.4
Tocantins	5.3	10.6	4.3	9.7	5.5	11.4	6.2	11.8	6.1	9.8
Maranhão	4.5	11.2	3.7	9.7	5	12.7	5.2	13	4.6	9.9
Mato Grosso	4.6	10.5	3.8	8.4	4.5	11.3	5.1	12	5.6	10.9

This division of labor not only reduces women's earnings by limiting the time they spend in paid activities, but it can also lead women to look for jobs that have flexible or shorter hours. Such work is more likely to be found in the informal sector or low-growth entrepreneurship. Thus, the proportion of average income of employed white women in relation to employed white men (76.2%) was lower than this ratio between women and men black or dark-skinned (80.1%) in 2018 (IBGE, 2019). The lower inequality between black and dark-skinned income may be related to the fact that this population has greater participation in occupations with lower incomes, often based on the minimum wage. This behavior occurred in every year, from 2012 to 2018 (IBGE, 2019).

In Brazil, female employment is still concentrated in sectors related to traditionally female roles, such as education (primary school teachers), accommodation and food, in call centers, social services and domestic services. When the employed population is distributed according to occupational groups in 2018, the lowest percentages were observed in skilled workers in agriculture, forestry, hunting and fishing (4.7%), with 47.4% of its workers between 40 and 49 years old. Within these 4.7%, 78.9% were men and only 21.1% were women (IBGE, 2019) (see Figure 5-13). On the other hand, women working as farmers and skilled workers in agricultural

[36] Available from: https://ftp.ibge.gov.br/Trabalho_e_Rendimento/Pesquisa_Nacional_por_Amostra_de_Domicilios_continua/Estudos_especiais/Mulheres_no_Mercado_de_Trabalho_2018.pdf

activities (excluding vegetable gardens, nurseries and gardens) received only 64.2% of men's income, the lowest percentage of all occupations considered (IBGE, 2019).

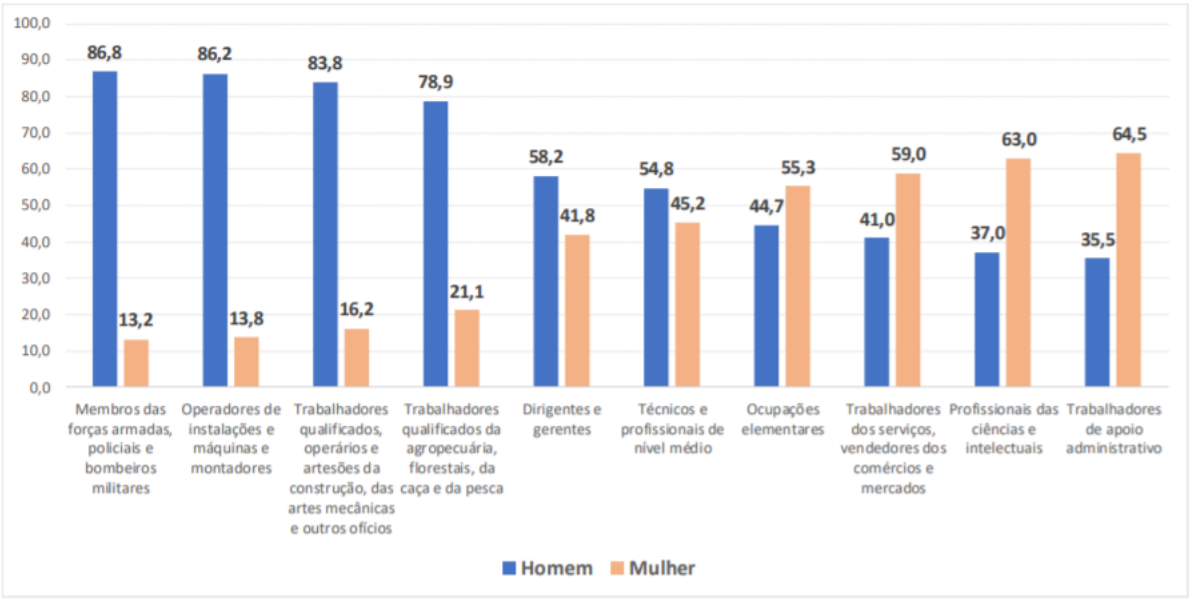


Figure 5-13. Percentage distribution (%) of the population aged 25 to 49 years old employed in the reference week, by occupational groups of the main job, by sex - Brazil - 4th quarter – 2018. Source: IBGE (2019), Directorate of Surveys, Coordination of Work and Income, Continuous National Household Sample Survey.

The COVID-19 pandemic worsened labor market conditions, which ended 2020 with the highest number of unemployed for a year since the historic series began.

The female entrepreneurship rate in Brazil is close to the regional average, with 15% of women of working age about to start or currently running a new business. This is also very close to the male rate of 16%. The participation of female entrepreneurs who operate physical businesses in Brazil is greater than that of male entrepreneurs - 71% against 55%. These data, taken together, suggest that there is a willingness among women to start businesses, but that there are barriers - real or perceived - to the growth of women-owned businesses.

The business training offered to women is often gender-biased, especially in rural areas, where women tend to take more traditional courses such as cooking and sewing. Companies with women owners are generally micro and small. They grow more slowly, use less labor and physical capital, and are focused on the trade, services and manufacturing sectors, which tend to be less profitable overall.

As for women with an account at a financial institution or with a mobile money service provider, in 2017, it was 67.5% of the female population aged 15 years or over[37].

Mobile phone access is more evident among women, but with great inequalities, for women living in rural areas (Table 5-14).

Table 5-14. Proportion of people aged 10 years and over who own a mobile phone (2019). Source: https://odsbrasil.gov.br/objetivo5/indicador5b1#

By Sex and By Household Situation						
Brazil, Greater Region and Federation Unit	Men			Women		
	Total	Urbana	Rural	Total	Urbana	Rural

[37] Available from: http://hdr.undp.org/en/indicators/167406

Brasil	79.3	83.3	56.5	82.5	85.4	62.4
Rondônia	80	84.3	66.9	82.4	86.6	66.3
Acre	68	79.2	39.8	73.3	83.3	41
Amazonas	63.4	70.8	30.1	72	77.7	35.8
Roraima	69.2	74.4	46.2	75.5	79	55
Pará	62.6	73.2	36.7	69.2	77.2	44
Amapá	73	76.8	47.4	74.3	77.2	47.8
Tocantins	75.1	78.8	60.7	81.2	84.2	65.7
Maranhão	55.9	67	32.8	65.1	74.6	41.9
Mato Grosso	84.8	87.2	72.7	87.6	89.4	75.9

The relation between gender and agriculture, particularly agribusiness, has evolved in recent years. According to the last Agricultural Census carried out by the IBGE (2017), there are 1.7 million women who declared themselves heads of a rural enterprise[38]. The proportion of farm heads rose from 12.6% (2006) to 18.6% (2017). According to IBGE, they are producers, managers and directly responsible for the main activities on the properties. These figures also reveal that women represent 29% of Brazilian agriculture, are in charge of 946,075 (18.7%) of the approximately 5 million rural properties accounted for by the survey, and that the number of rural establishments managed by women has grown by 38 % in 12 years. Even though agribusiness is a generator of wealth and local development, it is still little known how it included women in the labor market.

In terms of supporting women in agriculture, the National Program for Strengthening Family Agriculture offers a line of credit dedicated to women farmers who are part of a family production unit covered by Pronaf, regardless of their marital status.

Access to land

Access to land by women is another cross-cutting aspect of the land issue, permeating the various dimensions of analysis present in this document, and special attention should be given to the gender perspective, considering what follows. In Brazil, distortions in agricultural, forestry and environmental policies, laws and regulations, and their implementation have contributed to insecure property rights over land and timber, leading to persistent violent conflicts over resources - all affecting women and men in specific ways. In Brazil, where joint titling of women and men became an option in the 1988 Constitution, female land ownership remains very low (12.6% in the mid-1990s) because cultural practices have led to titling only by male householders and the resistance of the National Institute of Colonization and Agrarian Reform (INCRA) to joint titling because the forms used for land registration did not have space for two names until the 2001 reforms. Normative Instruction No. 981 of 2003, and later IN° 39 of 2007 established the obligation of joint land title for couples in marriage or in a stable union.

According to the 2017 Agricultural and Livestock Census, only 19% of agricultural establishments belonged to women. Establishments with an area of less than 1 ha have a more balanced gender ratio: 2 men to 1 woman (IBGE, 2017)[39]. Only 8.7% of cooperative producers are women (IBGE, 2017). It should be added that the CAR[40], a fundamental requirement for people to qualify as beneficiaries of Modalities 1 and 2 of the Floresta+ Pilot Project, does not register the gender of the owners or possessors who make the rural environmental registry. In other words, it is not possible to automatically recognize and differentiate men and women who are beneficiaries of the Project.

[38] Available from: http://sistemafaepa.com.br/blog/dia-internacional-da-mulher-conheca-a-historia-de-mulheres-que-vivem-o-agro- no-para/

[39] Available from: https://censos.ibge.gov.br/agro/2017/templates/censo_agro/resultadosagro/informativos.html

[40] The Rural Environmental Registry will be the object of specific analysis later in this document.

Family vulnerability and violence against women

Family vulnerability and domestic violence against women results from the analysis of public security indicators in the Amazon region, which reinforces the gender approach, since some data have already been mentioned in general in the human rights sub-dimension. According to Civil Registry Statistics 2019, 21,769 marriages were performed with female spouses up to 17 years old, or 2.1% of all marriages in 2019. In any case, the incidence of the phenomenon has been decreasing since 2011, when 48,637 marriages were registered with women up to 17 years old, or 4.7% of the year's total marriages. There is, however, one Federation Unit that presented, in 2019, a higher proportion of marriages involving women up to 17 years old than in Brazil eight years before: Rondônia (6.4%) (IBGE, 2021).

The production of indicators on violence against women runs into, among other difficulties, the underreporting of cases of sexual violence suffered by women and the absence of specific research on domestic violence (IBGE, 2021). It is possible, however, to focus on the issue of violence against women from the phenomenon of femicide, defined in Law n. 13,104, of 03.09.2015, of 2015 as homicide against women for reasons of the female condition - domestic or family violence and contempt or discrimination to the condition of being a woman (IBGE, 2021). The Ministry of Health's Mortality Information System - SIM is a source of data on homicides. In 2018, while 30.4% of female homicides occurred at home, for men, the proportion was 11.2%. Among women, black or dark-skinned women had higher homicide rates than white women, both at home and outside. At home, the rate for black or dark-skinned women was 34.8% higher than for white women; away from home was 121.7% higher (IBGE, 2021). In 2018, only 2.7% of Brazilian municipalities had a municipally managed shelter, 20.9% had specialized services for combating violence against women, and 9.7% offered specialized services for dealing with sexual violence.

5.2.3 Labor Conditions

Considering the Human Rights approach adopted in this Dimension of analysis, social rights are more directly visible in matters relating to labor conditions in the Legal Amazon. Social rights include the right to decent work, respect for labor rights (CLT), labor conditions (non-degrading and non-exploitative), and child labor. Here, situations of work analogous to slavery are evaluated; degrading labor conditions and child labor. In this sense, special attention should be given to work and income, general labor conditions, child labor and inspection institutions.

Work and Income

The Legal Amazon offers employment and income indicators that are more precarious than those in the rest of the country, and above all more hostile to young workers aged between 18 and 29 years. With a relatively younger workforce compared to the rest of Brazil, the Legal Amazon had, in 2019, 57% of people between 18 and 24 years old and 40% of those between 25 and 29 years old without any occupation. The rate of participation in the labor market was 58% for those aged between 18 and 24 (compared to 71% in the rest of the country) and, for people aged between 25 and 29, 71% in the Legal Amazon against 82% elsewhere of the country (Alfenas, Cavalcanti and Gonzaga, 2020).

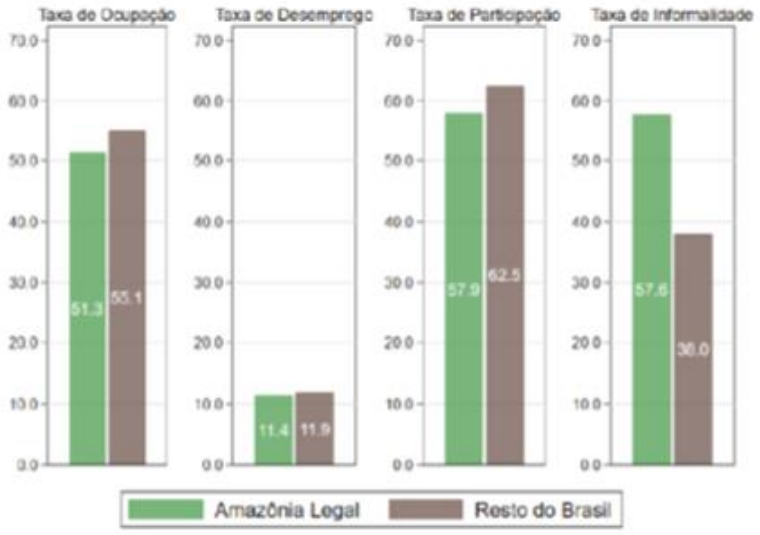


Figure 5-14. Characterization of the labor market, Legal Amazon and remaining Brazil (%), 2019.
Source: based on datafrom PNAD Contínua, IBGE.

The sum of the number of unemployed and discouraged people in the Legal Amazon in 2019 reached an amount of 2.4 million, which corresponded to 12% of the PIA. The same indicator for Brazil reveals 9.9%. At the end of the second quarter of 2020, the NEET group, people that are Not in Education, Employment or Training, represented 40% of young people aged 25 to 29, a number well above the proportion in the rest of the country, which was 31% (Alfenas, Cavalcanti and Gonzaga, 2020).

The effects of the new Coronavirus pandemic may have aggravated this situation.

The income from household work per capita was only R$ 654 in the Amazon region in 2019, around 40% less than the average value observed in the rest of the country, of R$ 1,074. On the other hand, 8% of households in the Legal Amazon received the Family Grant. In contrast, in the rest of Brazil, 4% of households received the Family Grant.

The public sector has a significant share in the income of workers in the Legal Amazon. Households from different income groups in the region were much more dependent on cash transfer programs than the rest of the country. In all, 10% of households in the Legal Amazon received assistance from some social program, while this percentage was 6% in the rest of Brazil. The proportion of poor households is also much higher in the Legal Amazon compared to the rest of Brazil: 15% of households in the region have a per capita household income below R$ 178, compared to 6% in the rest of the country (Alfenas, Cavalcanti and Gonzaga, 2020).

The Legal Amazon employs relatively more workers in the agricultural and commerce sectors, and relatively less in the industrial and service sectors. The agricultural sector, for example, employed 17% of the occupied population in the Legal Amazon in 2019, against 8% in the rest of the country (Alfenas, Cavalcanti and Gonzaga, 2020).

Overall, the numbers show that the Legal Amazon is much poorer than the rest of Brazil and that both labor income and per capita household income (RDPC) are much lower in the Amazon. The level of inequality of income from work is quite similar between regions. The results also show that, compared to the rest of the country, income from social programs, government aid and income from informal occupations are significantly more relevant in the composition of income in the poorest households in the Legal Amazon. On the other hand, labor income from the public sector (coming from civil servants and the military) is much more relevant for the richest households in the region (Alfenas, Cavalcanti and Gonzaga, 2020).

When adopting as a definition of poverty people living monthly with PCHI below R$89, 7% of the population in the Amazon region was found to be in this situation in 2019, compared to 3% in the rest of the country. By using a less restrictive measure as the poverty threshold, the proportion of individuals living with less than R$ 178 the

indicator reached 15% of the population in the Amazon region, a value well above the 6% observed in the rest of the country (Alfenas, Cavalcanti and Gonzaga, 2020).

General labor conditions

Two important international conventions dealing with forced labor were ratified by Brazil. Convention No. 29 on Forced or Compulsory Labor, which defines forced labor as "all work or service required of a person under the threat of sanction and for which he has not volunteered" was adopted in 1930 and ratified by Brazil in 1957. Convention No. 105 on the Abolition of Forced Labor which establishes that "forced labor may never be used or justified for purposes of economic development or as an instrument of political education, discrimination, discipline through work or punishment for participating of strike", was adopted in 1957 and ratified by the country in 1965 (ILO, 2011). The use of forced labor is therefore a practice prohibited by the Brazilian legal system.

According to official data from the Ministry of Labor, in the period from 1995 to 2020, around 56,021 people were rescued from work similar to slavery by the Labor Inspection (https://sit.trabalho.gov.br/radar/). The evolution of the number of Workers in Conditions Similar to Slave Labor since 2007 has been positive, in the sense of its significant decrease (Figure 5-15).

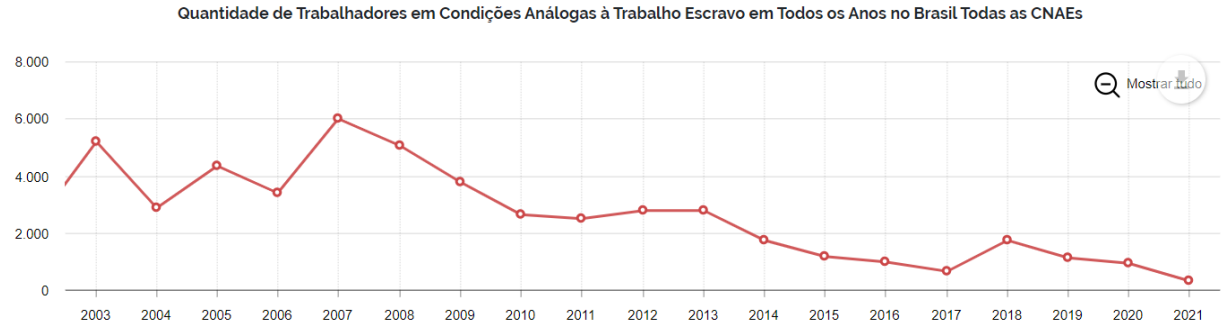


Figure 5-15. Number of Workers in Conditions Similar to Slave Labor in Brazil. Source: https://sit.trabalho.gov.br/radar/(accessed on May 23, 2021).

Knowing the number and profile of rescued victims allows us to identify the dimension of the problem and the risks existing in certain economic activities and production chains and, on the other hand, vulnerabilities related to sociodemographic and identity patterns (Table 5-15).

Table 5-15. Some data on People in a condition analogous to slavery – rescues from 1995 to 2020 - in the Legal Amazon. Source: https://smartlabbr.org/trabalhoinfantil/

Race most frequently involved: Person who fits as	

State	No.	Economic Sectors Most Often Involved	Dark-skinned, Mulatto, Cabocla, Cafuza, Mameluca or Black half-caste	Yellow (of Japanese, Chinese, Korean, etc. origin)	Black	White	Indigenous	Age most often involved	Education - percentage of illiterate and up to 5th grade incomplete	Gender
Rondônia	926	Cattle breeding (82%)	55%	8%	12%	25%	-	18-29 years old (40%)	64%	M (96%)
Acre	236	Cattle breeding (83%)	59%	19%	14%	4%	4%	18-29 years old (40,7%)	74%	M (96%)
Amazonas	462	Cattle breeding (66%) Forest Production - Native Forests (23%)	58%	-	12%	22%	8%	18-29 years old (42,2%)	73%	M (93%)
Roraima	90	Cattle breeding (49%) Wood splitting (27%)	67%	-	19%	1%	1%	18-29 years old (41,6%)	72%	M (92%)
Pará	13,225	Cattle breeding (65%) Forest Production - Native Forests (8%)	53%	18%	11%	17%	-	18-29 years old (49%)	77%	M (92%)
Amapá	37	Saltwater Fishing (62%) Precious Metal Ore Extraction (30%)	75%	25%	-	-	-	18-29 years old (66,7%)	58%	M (86%)
Tocantins	2,981	Cattle breeding (55%) Forest Production - Native Forests (14%)	44%	22%	13%	20%	2%	18-29 years old (46,5%)	67%	M (94%)
Mato Grosso	6,088	Cattle breeding (28%) Alcohol manufacturing (27%)	46%	11%	22%	21%	-	18-29 years old (40,9%)	62%	M (95%)
Maranhão	3,473	Cattle breeding (74%)	39%	31%	10%	19%	1%	18-29 years old (52,2%)	75%	M (96%)

Most people are in the agricultural sector (with great relevance to cattle breeding), fit as a Dark- skinned, Mulatto, Cabocla, Cafuza, Mameluca or Black half-caste races, are between 18 and 29 years old, illiterate or does not have 5th year of complete schooling and is male.

Although already in 2009, an ILO (2009) study on modern forms of slavery in Latin America, Asia, Africa and Europe concluded that slave labor in Brazil is found in deforestation zones in the Amazon and in rural areas with high rates of violence and conflicts dealt with over land. According to the publication, despite the advances made by the Brazilian government, "slave labor continues to be used in the country to deforest the Amazon, prepare the land for cattle raising and in activities related to agriculture in rural areas". The main cause responsible for slave labor has been cattle raising, as they are in deforestation zones in the Amazon. The problems extend over the strip of land that runs from Rondônia to Maranhão, with Pará being the most serious case. The most recent figures analyzed in Table 5-15 continue to highlight this problem. The ILO highlights that the most common form of forced labor is debt bondage, in which temporary workers are recruited through informal and unlicensed intermediaries, who attract workers through the payment of advances, and then profit by charging a series of inflated costs (ILO, 2009).

In addition to slave work, the expressive informality of the world of work illustrates the lack of good employment opportunities for young people and adults. The informality rate is almost 20 percentage points above what is seen in the rest of Brazil, which results in a decrease in income, as seen above. In 2019, more than half of those employed (58%) did not have a formal contract or were self-employed without contributing to Social Security (Alfenas, Cavalcanti and Gonzaga, 2020).

Child labor

The term “child labor” has been defined as “all work that deprives children and adolescents of their childhood, their potential and their dignity, and that is harmful to their physical and psychological development” (ILO, 2020, p.5). "Whether or not to classify a specific activity as "child labor" will depend on the child's age, the type of work in question and the number of hours being devoted to this work, the conditions under which it is carried out and the intended objectives" (ILO, 2020, p.5). Brazil has ratified the Convention on the Rights of the Child, reflected since 1990 in the Statute of the Child and Adolescent (ECA)[41], which states in its Chapter V, On the Right to Professionalization and Protection at Work, Article 60, that “any work for children under the age of fourteen is prohibited, except as an apprentice.”

Often, in households where living conditions are precarious (low income, insecurity and economic instability in households, with barriers to access to quality services), and in regions or states with less socioeconomic development, there are major reasons for sending of sons and daughters to work, or to take them out of school due to the impossibility of bearing the educational costs (UNESCO, 2015 in ILO, 2020, p.6).

According to the Digital Observatory for the Prevention and Eradication of Child Labor[42], Brazil, between 1992 and 2015, had a significant reduction of 68% of children and adolescents who stopped working (about 5.7 million). However, data from 2010 show that there are still 2.7 million children and adolescents in child labor in the country (59% boys and 41% girls). Most of this population is in the Northeast (852 thousand) and North (311 thousand) regions. An important fact is that all regions have a higher incidence of child labor in non-agricultural activities, except for the North region. The total number of employed children and adolescents between 10 and 17 years old in 2010, shown in Table 5-16, is very worrying, knowing that a large portion of these numbers involves prohibited work and often the worst forms of child labor, according to the Observatory.

In addition to data from the 2010 Demographic Census, the Digital Observatory for the Prevention and Eradication of Child Labor collects other data, for example, from 2017 through: i) Prova Brasil (SAEB), promoted by INEP/MEC, of a census nature, reaching all Brazilian public schools, with one of the student questionnaires addressing the topic of work outside the home; ii) IBGE Agricultural Census, with data on child labor of children under 14 years of age in agricultural establishments. Thus, Table 5-16 shows a number of children and adolescents victims of slave labor according to their place of birth, considering the records with birthplace determined since 2003, more relevant in the states of Maranhão (166) and Pará (158), where the total number of children and adolescents under 14 years old employed in agricultural establishments is also higher: Pará (81,300) and Maranhão (38,200), followed by Amazonas (37,800). Most of these children are employed in agricultural establishments with kinship ties with the producer, from which it is possible to infer that the abuse of child labor does not appear as a risk in the perception of potential beneficiaries of the Floresta+ Pilot Project, and it is necessary to ensure supervision in this aspect when implementing the project. Furthermore, the number of 5th and 9th grade students from public schools who declared to work in research carried out during the Prova Brasil 2017 is also more relevant in these three states.

Table 5-16. Some data on child labor in the Legal Amazon. Source: https://smartlabbr.org/trabalhoinfantil/

State	Children and teenagers between 10 and 17 years old (2010 DemographicCensus)	Number of children and teenagers from the locality rescued from SLAVE Labor (2003 to 2018)	Number of children and teenagers UNDER 14 years old employed in agricultural establishments (IBGE – Agricultural, Forestry and Aquaculture Census, 2017)	Percentage of children and teenagers UNDER 14 years oldworking in agricultural establishments with family tieswith the producer (IBGE – Agricultural, Forestry andAquaculture Census, 2017)	5th and 9th grade students from public schools who work outside the home (INEP, ProvaBrasil 2017)
Rondônia	46,000	18	17,200	88.9%	5,900

[41] https://www.unicef.org/brazil/estatuto-da-crianca-e-do-adolescente
[42] Available from: https://smartlabbr.org/trabalhoinfantil/

Acre	16,500	4	11,300	95.4%	2,300
Amazonas	82,600	14	37,800	94.8%	14,400
Roraima	11,200	0	8,500	95.5%	1,900
Pará	180,100	158	81,300	89.2%	28,400
Amapá	12,300	0	2,300	92.1%	2,900
Tocantins	30,300	66	13,00	84.7%	6,200
Mato Grosso	69,900	39	26,200	77.3%	10,800
Maranhão	144,300	166	38,200	89.8%	24,600

The United Nations Children's Fund (UNICEF) “UNICEF Seal” initiative should be highlighted to encourage and recognize real and positive advances in the promotion, realization and guarantee of the rights of children and adolescents in municipalities in the Semiarid Region and in the Brazilian Legal Amazon (https

://www.selounicef.org.br/sobre). Each cycle of the UNICEF Seal lasts four years, in which municipalities must adhere to the initiative, participate in training, develop an action plan, mobilize the local community to participate in decisions, monitor the evolution of social indicators, and be monitored and evaluated. Those who make the most progress are recognized with the UNICEF Seal. Between 2017 and 2020, 116 municipalities in the Amazon received the UNICEF Seal for having effectively improved the living conditions of children and adolescents (Table 5-17).

Table 5-17. Municipalities in the Legal Amazon that received the UNICEF Seal between 2017 and 2020.

Federation Unit	Number of Participating Municipalities	Number of Certified Municipalities
Rondônia	52	9
Acre	18	4
Amazonas	56	8
Roraima	14	4
Pará	117	16
Amapá	16	3
Tocantins	88	5
Mato Grosso	74	11
Maranhão	209	56
Amazônia Legal	644	116

It is emphasized that the pandemic generated by COVID-19 will have great potential to aggravate existing vulnerabilities, including a greater risk of child marriage, child labor and teenage pregnancy (ILO, 2020).

Inspection institutions

In 1995, Brazil began to recognize the existence of slave labor in the country and began to adopt actions to address this existing reality, namely, the Special Mobile Inspection Group in Brazil (GEFM) was created, associated with the Department of Labor Inspection (SIT) of the Ministry of Labor and Employment (MTE). GEFM operates nationwide and aims to combat work in conditions similar to slavery, eliminating child labor.

In 2003, the National Plan for the Eradication of Slave Labor was created, with preventive and repressive proposals to combat slave labor, indicating the bodies that should collaborate in the implementation of proposals, and the National Commission for the Eradication of Slave Labor was created (Conatrae), linked to the Ministry of Human Rights and chaired by the Minister of State for Human Rights, with the objective of

coordinating and evaluating the implementation of actions provided for in the National Plan for the Eradication of Slave Labor. In 2008, Conatrae launched the 2nd National Plan for the Eradication of Slave Labor. Other policies to combat slave labor, among them the Pastoral Land Commission (first non-governmental institution aimed at combating work in conditions analogous to slavery created in 1975) or the NGO Repórter Brasil (founded in 2001), play a fundamental role in the fight against slave labor in Brazil. Another advance in the implementation of public policies to combat this exploitation was the creation of the "Dirty List", which corresponds to a register of companies and people processed as a result of the use of slave labor[43], which shows that agribusiness continues to be the sector that more subjects workers to a condition analogous to slavery in Brazil.

Practically no municipality in the Legal Amazon states has established a Committee or Commission to Combat Slave Labor - only 2 municipalities in Maranhão (Table 5-18) - and very few have developed programs to combat forced or slave labor and reinsertion of its victims. At the state level, only Maranhão and Mato Grosso have a Commission to Combat Slave Labor, which reveals a weak institutional capacity. The also deficient inspection infrastructure in these regions contributes to the exploitation of slave labor.

Table 5-18. Actions by Municipalities in the Legal Amazon to Combat Slave Labor.
https://smartlabbr.org/trabalhoescravo/localidadecompare/11?dimensao=garantiaDireitos&compare=21

Federation Unit	State Committee or Commission to Combat Slave Labor	Number and % of Municipalities with Committee or Commission to Combat Slave Labor (2019)	% of Municipalities with program to fight forced or slave labor and reintegration of its victims (2019)
Rondônia	Não	0	5 (9.6%)
Acre	Não	0	2 (9.1%)
Amazonas	Não	0	10 (16.1%)
Roraima	Não	0	4 (26.7%)
Pará	Não	0	15 (10.4%)
Amapá	Não	0	3 (18.8%)
Tocantins	Não	0	12 (8.6%)
Mato Grosso	Sim	0	16 (11.3%)
Maranhão	Sim	2 (0.9%)	26 (12%)

5.3 Territories and Cultures

The diversity of the population of the Legal Amazon reflects the history of the region. Originally occupied by indigenous populations, the region received significant migratory influxes from the Northeast region of the country in the so-called first and second rubber cycles, that is, in the expansion of rubber plantations, which occurred, respectively, in the second half of the 19th century and in the years of World War II. In the 1970s there was the arrival of more inhabitants attracted by the exploration of gold and precious stones. From the 1980s onwards, the search for land intensified mainly in Rondônia and Mato Grosso; this state has become one of the largest soy producing centers in Brazil (EMBRAPA)[44].

In turn, the observed cultural diversity is even broader and more complex, even presenting great linguistic diversity. The way of life of the Amazon population is diversified, marked by different indigenous peoples and traditional communities with different dynamics of use and occupation of rural areas. Given that the target beneficiaries of the Floresta+ Amazônia Pilot Project are made up of small farmers and family farmers,

[43] Updated version on 5/17/2021 is available from https://www.gov.br/trabalho/pt-br/inspecao/areas-de-atuacao/cadastro_de_empregadores-1.pdf

[44] Available from: https://www.infoteca.cnptia.embrapa.br/bitstream/doc/907075/1/GBMJEstudoAMZDA1vISSN.pdf

indigenous peoples and traditional communities, it is important to recognize the social and cultural diversity of the population of the Legal Amazon. Elements of this diversity are deepened in the Territories and Cultures Dimension.

The Federal Constitution of 1988 (CF/88) engendered an important effort in ordering a system of norms that could effectively guarantee the territorial right of indigenous peoples over traditionally occupied lands. The Brazilian State undertakes to “demarcate, protect and ensure respect” for the traditionally occupied lands, through the implementation of various provisions in which they dispose of their territories and cultures.

In this way, the CF/88 allowed a move away from the concern with "origin" and "cultural isolation", avoiding the usual confusion between "tradition" and "custom" that linked the sense of traditional to customary law, preventing the freezing of legal practices that would correspond to it (Viegas, 2017, p. 71 apud Almeida, 2006,

p. 6). In this sense, the evolutionary precepts of assimilation of indigenous peoples into the dominant society were displaced by the establishment of a new legal relationship between the State and traditional peoples and communities, based on the recognition of cultural and ethnic diversity (Almeida, 2004).

According to CF/88, Chap. VIII, art. 231 and 232, indigenous peoples have the original rights and exclusive usufruct over the lands they traditionally occupy:

- The lands traditionally occupied by the Indians are those which they inhabit on a permanentbasis, those used for their productive activities, those essential to the preservation of environmental resources necessary for their well-being and those necessary for their physical and cultural reproduction, according to their uses, customs and traditions.
- The lands traditionally occupied by the Indians are destined for their permanent possession,and they are responsible for the exclusive use of the resources of the soil, rivers and lakes existing in them.
- Indigenous lands are inalienable and unavailable, and the rights over them areimprescriptible.
- The removal of indigenous groups from their lands is prohibited.
- Acts that have as their object the occupation, domain and possession of indigenous lands, or the exploitation of the natural resources of the soil, rivers and lakes existing therein, arenull and void, without legal effects.

Within this perspective, the issue of the rights of indigenous peoples can be underlined from three important axes:

1. the State no longer adopts the purpose of guaranteeing the integration of indigenous peoples into thenational community, explicitly recognizing them “their social organization, customs, languages, beliefsand traditions” (art. 231);
2. Indigenous people are recognized as having full civil capacity, being able to freely associate in order torepresent their interests without the intervention of the indigenous agency;
3. the State must guarantee the indigenous permanent possession and exclusive use of the resources of the soil, rivers and lakes of the lands on which they exercise a traditional occupation (Oliveira, 2017).

Regarding the land tenure regularization of indigenous lands, Law No. 6,001, of December 19, 1973, which provides for the Indigenous Statute, devoted special attention to the demarcation of indigenous lands, establishing the demarcation process "on the initiative and under the guidance of the federal agency for assistance to the Indian”. This law, in art. 25, establishes that indigenous peoples have the right "to permanent possession of the lands they inhabit, pursuant to article 198 of the Federal Constitution, shall be independent of their demarcation", and obliges the Brazilian State to comply with the right to indigenous land, " without

prejudice to the appropriate measures that, in the omission or error of the aforementioned body, any of the Powers of the Republic may be taken"[45].

One of the main mechanisms for the protection and feasibility of administrative procedures for the demarcation of indigenous lands was Decree No. 1775, of January 8, 1996[46]. According to the National Indian Foundation (FUNAI), the stages of the procedure for demarcating traditionally occupied indigenous lands are the responsibility of the Executive Power[47].

Pursuant to current legislation (CF/88, Law No. 6,001/73, Decree No. 1775/96), indigenous lands can be classified in the following Modalities[48]:

- Traditionally Occupied Indigenous Lands: the indigenous lands referred to in art. 231 of the Federal Constitution of 1988, an original right from indigenous peoples, whose demarcation process is regulated by Decree No. 1,775/96.
- Indigenous Reserves: Lands donated by third parties, acquired or expropriated by the Union, which areintended for the permanent possession of indigenous peoples. These are lands that also belong to theUnion's heritage but are not to be confused with traditionally occupied lands. Some indigenous lands,however, were reserved by member states, mainly during the first half of the 20th century, which are recognized as traditional occupation.
- Domain lands: are lands belonging to indigenous communities, under any form of domain acquisition, under the terms of civil law.
- Interdicted: These are areas interdicted by Funai for the protection of isolated indigenous peoples andgroups, with the establishment of restrictions on the entry and transit of third parties in the area. The interdiction of the area can be carried out concurrently or not with the demarcation process, regulatedby Decree No. 1,775/96.

Quilombola communities, in turn, have their right to land guaranteed in CF/88, in art. 68 of the Transitory Constitutional Provisions Act (ADCT). It is a legal provision that the Brazilian State guaranteed land ownership "to the remnants of the quilombo communities that are occupying their lands, definitive ownership is recognized, and the State must issue them the respective titles".

According to Decree No. 4,887/2003, which establishes legal and administrative instruments for the recognition, identification, delimitation and demarcation of quilombola territories, the National Institute of Colonization and Agrarian Reform (INCRA) is the competent autarchy, at the federal level, for the title of the quilombola territories. It is up to INCRA, "the identification, recognition, delimitation, demarcation and titling of the lands occupied by the remnants of the quilombola communities, without prejudice to the concurrent competence of the States, the Federal District and the Municipalities"[49].

The Federal Heritage Secretariat (SPU) is also responsible for issuing title or Real Usage Right Concession Agreement (CCDRU) to quilombola communities located in areas under its management. It is also up to the States and Municipalities to issue the titles to the quilombola communities that are located on lands under state and municipal domain, respectively[50].

Decree No. 4,887/2003 defines quilombola communities as: "ethnic-racial groups, according to self-attribution criteria, with their own historical trajectory, endowed with specific territorial relations, with a presumption of black ancestry related to resistance to the historical oppression suffered"[51].

[45] Available from: http://www.planalto.gov.br/ccivil_03/leis/l6001.htm. Accessed on: 01/06/2021
[46] Available from: http://www.planalto.gov.br/ccivil_03/decreto/d1775.htm. Accessed on: 01/06/2021
[47] Available from: https://www.gov.br/funai/pt-br/atuacao/terras-indigenas/demarcacao-de-terras-indigenas. Accessed on:01/06/2021.
[48] Available from: http://www.funai.gov.br/index.php/indios-no-brasil/terras-indigenas. Accessed on: 01/06/2021
[49] Available from: http://www.planalto.gov.br/ccivil_03/decreto/2003/d4887.htm. Accessed on: 04/06/2021
[50] https://antigo.incra.gov.br/pt/quilombolas.html
[51] INCRA. Regularização de Território Quilombola. Diretoria de Ordenamento da Estrutura Fundiária, Coordenação Geral de Regularização de Territórios Quilombolas DFQ, 2017. Available from:https://antigo.incra.gov.br/media/docs/quilombolas/perguntas_respostas.pdf. Accessed on: 04/06/2021

The self-denominated communities of terra de preto, black communities, mocambos, quilombos, among other similar denominations, are entitled to the issuance of a self-definition certificate by FCP Ordinance No. 98, of November 26, 2007, under the following terms[52]:

- Minutes of a specific meeting to address the topic of Self-Declaration, if the community does not havean established association, or Minutes of the meeting, if the association is already formalized, followedby the signature of the majority of its members.
- Brief Historical Report of the community, telling how it was formed, what are its main family trunks, itstraditional cultural manifestations, productive activities, festivities, religiosity, etc.
- Certification application addressed to the presidency of this FCP.

CF/88 also paid special attention to the environment, establishing in its article 225 that a balanced environment is everyone's right. One of the main mechanisms of protection and feasibility of this constitutional guarantee are the Conservation Units (UCs), which are regulated by Law No. 9,985, of July 18, 2000, which institutes the National System of Nature Conservation Units[53].

Cerqueira (2015) emphasizes that the legal framework for the development of public policies for traditional peoples and communities living in protected areas appears clearly with Decree No. 6.040/2007, which instituted the National Policy for the Sustainable Development of Traditional Peoples and Communities, which ensured continuity in the processes of recognition and protection of the territories of this social segment that were historically excluded and/or neglected.

ILO Convention 169

Based on these premises of the National Policy for the Sustainable Development of Traditional Peoples and Communities, Decree No. 5,051/04, revoked by Decree No. 10,088 of 2019, which promulgated Convention No. 169 of the International Labor Organization - ILO on Indigenous and Tribal Peoples, reaffirmed the recognition of territorial and cultural rights to indigenous peoples and traditional communities. Convention 169 is considered the main international instrument of a binding nature on the human rights of traditional peoples and communities, in order to guarantee respect for the different forms of social organization and development of their territories.

Convention 169 recognizes that cultural diversity also entails a diversified treatment of subjects with specific rights, rights that are called cultural, and linked to: I) the affirmation of an ethnic or cultural identity; II) self-determination as a people or community; III) participation and consultation, to the extent of their cultural distinction; and IV) to the traditionally occupied territory (Almeida et al., 2013).

Convention 169 founded a new perception of traditional peoples and communities, viewing them no longer as people capable of integration and assimilation into the national society, but as ethnic groups that have traditional lifestyles and a different culture and way of life. According to Dourado (2013), the term indigenous refers to people who fully and partially preserve their own traditions, institutions or lifestyles that distinguish them from the dominant society and who inhabited a specific area before the arrival of other groups. The meaning of tribal in Convention 169 must be considered in a broader sense of the word, involving all social groups that identify themselves as different and that are recognized as such.

For this reason, Convention 169 has been used and appropriated by traditional peoples and communities as the main legal basis for their demands. Within this line of thought, the aforementioned Convention states that the criterion for saying whether the members of communities are or are not traditional peoples or communities is self-definition. To some extent, Convention 169 has legitimized the action rationale of social movements in search of respect for the rights of peoples and traditional communities (Filho, 2015).

[52] Available from: http://www.palmares.gov.br/wp-content/uploads/2010/11/legis21.pdf. Accessed on: 04/06/2021
[53] Available from: http://www.planalto.gov.br/ccivil_03/leis/l9985.htm. Accessed on: 01/06/2021

With specific regard to the territorial right of traditional peoples and communities, Convention No. 169, in its art. 14, clarifies the law over traditionally occupied territories.

- Interested peoples should be recognized as having property and tenure rights over the lands they traditionally occupy. In addition, where appropriate, measures should be taken to safeguard the right of interested peoples to use land that is not exclusively occupied by them, but to which they have traditionally had access for their traditional and livelihood activities. In this regard, special attention should be given to the situation of nomadic peoples and itinerant farmers.
- Governments should take the necessary steps to determine the lands that interested peoples traditionally occupy and ensure effective protection of their property and tenure rights.
- Appropriate procedures should be instituted within the national legal system to resolve land claims made by interested peoples.

In addition to Convention 169, Brazil ratified the Convention on Biological Diversity; the Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2007); and the United Nations Declaration on the Rights of Indigenous Peoples, approved by the United Nations General Assembly on September 13, 2007. These are the most important international mechanisms that aim to address the existing inequality between traditional peoples and communities and other citizens (Filho, 1995).

The United Nations Declaration on the Rights of Indigenous Peoples was a historic landmark for the recognition of the rights of indigenous peoples, as it provides, at a universal level, the minimum standards to ensure survival, dignity, well-being and respect for the rights of indigenous peoples. According to the Instituto Socioambiental (ISA), the declaration contains principles such as equal rights, recognizing at the same time the right of all peoples to be different and the need to make consent the basis of all relationships between indigenous peoples and States[54].

- Self-determination: Indigenous peoples have the right to freely determine their political status and freely pursue their economic, social and cultural development, including their own education, health, financing and conflict resolution systems, among others. This was one of the main points of contention between countries; its opponents claimed that this could lead to the founding of indigenous "nations" within a national territory.
- Right to free, prior and informed consent: like Convention 169 of the International Labor Organization(ILO), the UN Declaration guarantees the right of indigenous peoples to be properly consulted before adopting legislative or administrative measures of any kind, including infrastructure works, mining or use of water resources.
- Right to reparation for theft of their property: the declaration requires national states to redress indigenous peoples with respect to any cultural, intellectual, religious or spiritual property taken awaywithout prior informed consent or in violation of their traditional norms. This may include the restitution or repatriation of sacred ceremonial objects.
- Right to maintain their cultures: this right includes among others the right to maintain their traditionalnames for places and people and to understand and make themselves understood in political, administrative or judicial proceedings including through translation.

Right of Participation and Right to Information

The Brazilian State recognized traditional peoples and communities as culturally differentiated groups, guaranteeing social protagonism and participation. Based on this, traditional peoples and communities have the right to participate in a collective and culturally differentiated manner.

[54] Available from: https://pib.socioambiental.org/pt/Declara%C3%A7%C3%A3o_da_ONU_sobre_direitos_dos_povos_ind%C3%ADgenas. Accessed on: 31/05/2021

According to Dourado (2013), participation and consultation are two words that are not confused, although they are similar. Consultation is understood as a form of participation, however, it is not the only one, so that the right to participation is not limited to the right to consultation. “Both terms must be critically observed, as they are increasingly part of the lexicon of the interlocution of traditional peoples and communities with the State” (Dourado, 2013, p. 39).

The right of participation and the right to information are rights recognized by the Brazilian State, both in national and international norms and, in the case of traditional peoples and communities, Convention 169 has an important role as a binding legal basis. The term participation appears in the text of the Convention in different articles and in different ways with regard to consultations[55].

- Article 2 - Participation in the development of action to protect their rights and ensure respect for their integrity.
- Article 6 - Participation in all programs and policies that affect them, at all decision-making levels.
- Article 7 - Participation and cooperation in general economic development plans drawn up for the regions where they live.
- Article 20 - Participation in the use, administration and conservation of natural resources existing on their lands and participation in the benefits provided by exploration and fair compensation.

From a conceptual point of view, Decree No. 5,051/2004, revoked by Decree No. 10,088, of 2019, establishes that governments shall "consult interested peoples, through appropriate procedures and, particularly, through their representative institutions, whenever they are legislative or administrative measures likely to affect them directly”. As mentioned in art. 7 of Convention 169, consultations with traditional peoples and communities must be conducted in good faith and in an appropriate manner and considering specific situations and contexts.

5.3.1. Indigenous Peoples

According to current legislation (CF/88, Law 6001/73, Decree No. 1775/96), indigenous lands can be classified into the following categories:

- Traditionally Occupied Indigenous Lands: These are the indigenous lands referred to in art. 231 of the Federal Constitution of 1988, an original right of indigenous peoples, whose demarcation process is regulated by Decree No. 1,775/96.
- Indigenous Reserves: Lands donated by third parties, acquired or expropriated by the Union, which aredestined to the permanent possession of indigenous peoples. These are lands that also belong to the Union's heritage but are not to be confused with traditionally occupied lands. Some indigenous lands,however, were reserved by member states, mainly during the first half of the 20th century, which are recognized as traditionally occupied.
- Dominial Lands: These are lands belonging to indigenous communities, under any form of domain acquisition, pursuant to civil law.
- Restricted: These are areas interdicted by Funai for the protection of isolated indigenous peoples, withthe establishment of restrictions on the entry and transit of third parties in the area. The interdiction of the area can be carried out concurrently or not with the demarcation process, regulated by Decree No. 1775/96.

According to the Federal Constitution, indigenous peoples have the original right and exclusive usufruct of traditionally occupied lands. The stages of the demarcation process of traditionally occupied lands, described below, are defined by a Presidential Decree and consist of:

- Under study: Carrying out studies of ethno-history, sociological, legal, cartographic, environmental and land surveys that support the identification and delimitation of indigenous

[55] Available from: http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2004/decreto/d5051.htm. Accessed on: 31/05/2021

lands.

- Delimited: Lands whose studies were approved by Funai and which are in the administrative analysis phase for the issuance of the Declaratory Ordinance of traditional indigenous ownership by the Ministry of Justice.
- Declared: Lands that have obtained the issuance of the Declaratory Ordinance by the Minister of Justice and are authorized to be demarcated, with the materialization of landmarks and georeferencing.
- Approved: Lands that have their boundaries materialized and georeferenced, whose demarcation was ratified by decree of the Presidency of the Republic.
- Regularized: Lands that, after the ratification decree, were registered at the Notary Office in the name of the Union and at the Union Patrimony Secretariat.
- Restricted Areas: Areas with restrictions on the use and entry of third parties, for the protection of isolated indigenous peoples.

According to FUNAI (Figure 5-16), there are 430 indigenous lands in the Legal Amazon at different stages of the demarcation process. It can be observed that 337 indigenous lands are ratified/regulated and 84 territories are in the process of demarcating studies, delimitations, declaration of areas not yet finalized and consequently not ratified[56].

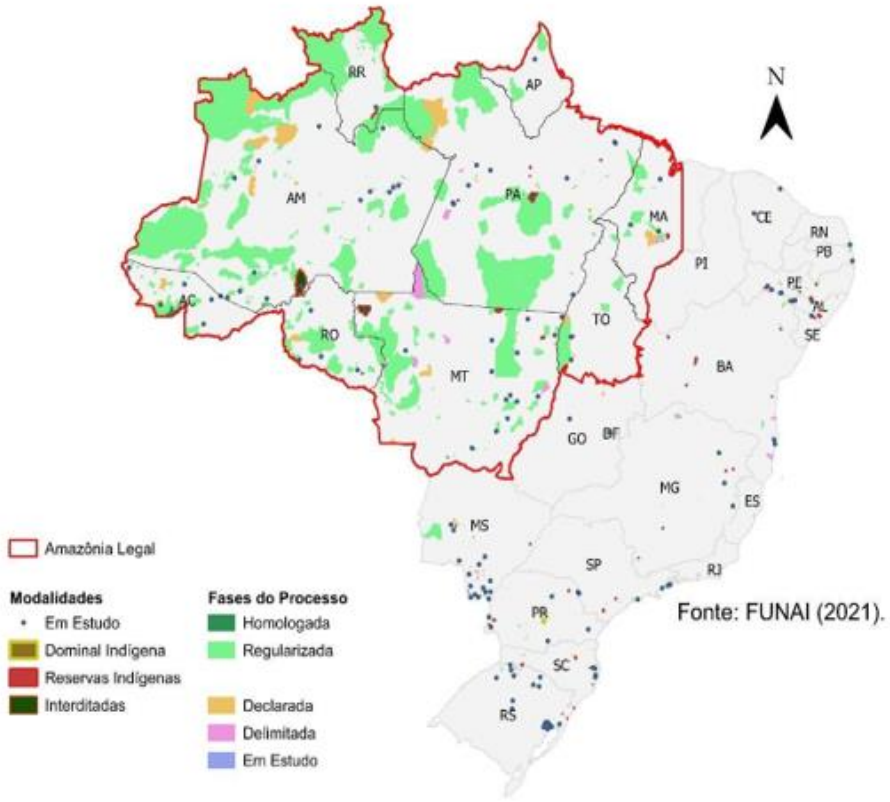


Figure 5-16. Demarcation of Indigenous Lands in the Legal Amazon.

Table 5-19 shows that, for the most part, indigenous lands in the Legal Amazon are homologated and/or regularized, distributed over a surface of approximately 131 million hectares. It is noteworthy that the largest

[56] Available from: http://www.funai.gov.br/index.php/indios-no-brasil/terras-indigenas. Accessed on: 01/06/2021

areas approved and/or regularized are in the states of Amazonas and Pará, distributed in 169 indigenous lands, with 44.5 million hectares in Amazonas and 30.4 million hectares in Pará.

Table 5-19. Indigenous Land titling processes.

Process Phase	Indigenous Lands	Surface (ha)
Under study	47	886,754.00
Delimited	12	1,375,821.46
Declared	25	10,333,636.02
Ratified	12	1,910,407.51
Regularized	325	128,441,959.55
Indigenous reserve	9	25,099.11

Source: Funai, 2021.

When evaluating the amount of non-approved indigenous lands, 47 indigenous lands are still in the study phase, with no estimation of territorial delimitation. As can be seen in Table 5-20, most are in the states of Amazonas, Mato Grosso and Pará. Some of these indigenous lands are restricted in use because they are territories of isolated peoples[57]. According to the Oswaldo Cruz Foundation (Fiocruz), on the border between the states of Amazonas, Rondônia, Mato Grosso and Pará, there are traces of the existence of isolated Indians who need to have their territories demarcated. Paradoxically, the region is characterized by disorderly occupation of the land, illegal occupation of public lands, intensive deforestation and the incipient presence of the State[58].

Table 5-20. Indigenous Land under Study in the Legal Amazon. Funai, 2021.

State	Indigenous Lands	Surface (ha)
Amazonas	13	453,400.00
Acre	5	287.00
Roraima	1	40,095.00
Rondônia	4	8,070.00
Mato Grosso	9	242,500.00
Pará	11	142,402.00
Maranhão	2	0
Tocantins	2	0

According to Table 5-21, 84 indigenous lands are in the process of studies, delimitation and declaration, totaling more than 11 million hectares. Indigenous lands are known to ensure the permanence of the forest, the protection of biodiversity and climate balance (Nery, 2013). However, as they are not regularized, the invasion of indigenous lands to build ranches for cattle raising and illegal logging occurs, as well as the increase in conflicts and violations of territorial rights. One of the risks for indigenous peoples concerns the changes observed in the legal marking for land and environmental regularization in the country, which included the registration of rural properties in the CAR with dimensions larger than the real ones and the overlapping of areas of properties and possessions, with conservation units, rural settlements and areas of indigenous peoples and traditional communities.

Table 5-21. Delimitation of Indigenous Lands. Funai, 2021.

[57] Available from: http://sii.funai.gov.br/funai_sii/informacoes_indigenas/visao/visao_terras_indigenas.wsp. Accessed on:01/06/2021

[58] Available from: http://mapadeconflitos.ensp.fiocruz.br/conflito/mt-funai-ministerio-publico-e-policia-federal-dao-bom-exemplo- na-defesa-do-povo-kawashiva-ameacado-de-extincao-pela-acao-de-grileiros-e-madeireiros/. Accessed on: 01/06/2021.

State	Process phase	Nº	Surface (ha)
Amazonas	Delimited	3	41,623.29
	Declared	12	9,465,025.07
Acre	Declared	1	20,534.22
Mato Grosso	Delimited	4	1,179,662.00
	Declared	6	602,052.72
Pará	Delimited	4	54,315.17
	Declared	4	39,558.00
Maranhão	Delimited	1	100,221.00
Tocantins	Declared	2	206,466.00

Spatial distribution

The 2010 demographic census counted 383,683 thousand self-declared indigenous people living in all nine states of the Legal Amazon, many of whom live in precarious conditions. It is estimated that indigenous peoples living in the Legal Amazon correspond to 46.9% of the country's indigenous population. The state of Amazonas concentrates 44% of the indigenous population (IBGE, 2010).

Table 5-22. Distribution of Indigenous Population by State (2010). Source: IBGE, Demographic Census 2010.

Legal Amazon	Total Population	%
Amazonas	168,680	44.0%
Roraima	49,637	12.9%
Mato Grosso	42,538	11.1%
Pará	39,081	10.2%
Maranhão	35,272	9.2%
Acre	15,921	4.1%
Tocantins	13,131	3.4%
Rondônia	12,015	3.1%
Amapá	7,408	1.9%
Indigenous Peoples in Legal Amazon	383,683	100.0%

The 2010 Census revealed that indigenous peoples are present in both rural and urban areas. It is noteworthy that 81% of the indigenous peoples of the Legal Amazon live in rural areas. Figure 5-17 shows that the highest percentage of indigenous peoples living in communities (villages) is in the states of Amazonas and Roraima.

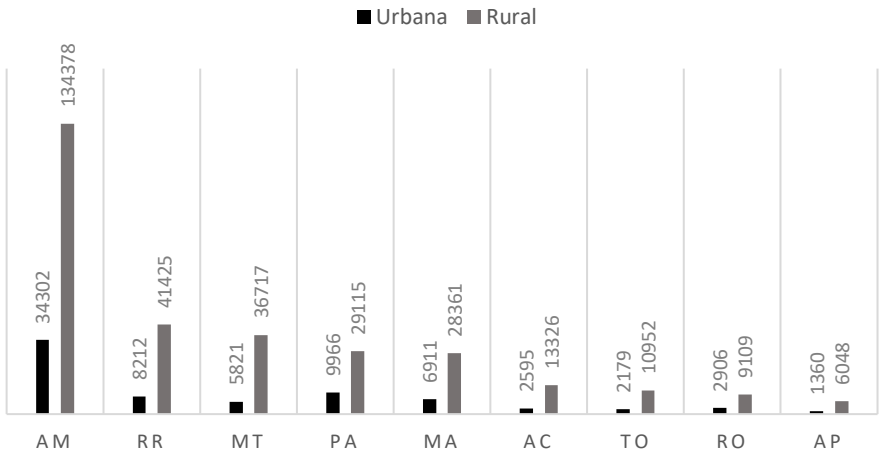


Figure 5-17. Distribution of the indigenous population in rural and urban areas (2010). Source: IBGE, Demographic Census2010.

Regarding the municipalities with the largest indigenous populations, the state of Amazonas stands out with 7 municipalities (Table 5-23). In second place comes Roraima with 2 municipalities and in third place Mato Grosso with 1 municipality. The municipalities of São Gabriel da Cachoeira in Amazonas and Uiramutã in Roraima stand out with the largest indigenous population when compared to the general population.

Table 5-23. Municipalities with the largest indigenous populations in the Legal Amazon (2010). Source: IBGE, Demographic Census 2010.

	Municipalities with the largest indigenous populations	Rural
Amazonas	São Gabriel da Cachoeira	18,001
	Tabatinga	14,036
	São Paulo de Olivença	12,752
	Benjamin Constant	8,704
	Santa Isabel do Rio Negro	8,584
	Barcelos	6,997
	Atalaia do Norte	5,840
Mato Grosso	Campinápolis	7,589
Roraima	Alto Alegre	7,457
	Uiramutã	6,734

Public policy

The National Policy for Territorial and Environmental Management of Indigenous Lands (PNGATI) is a law that has its genesis through long articulations between state institutions and the claims of indigenous peoples through their movements, organizations and social struggles. PNGATI is configured in the guarantee of indigenous participation in various instances of governance decision, thus resulting in a change in the legal paradigm of tutelage.

The construction process of PNGATI officially began on September 12, 2008, when Interministerial Ordinance No. 276 was published in the Official Gazette of the Union. In this document, an Inter-Ministerial Working Group (GTI) was created, which was composed of technicians from the Ministry of Justice and the Ministry of the Environment, representatives of indigenous peoples from all regions of Brazil and representatives of civil society

organizations, for the purpose of preparing a proposal for the National Policy on Territorial and Environmental Management for Indigenous Lands (Bavaresco; Menezes, 2014).

Decree No. 7,447, of June 5, 2012, which established PNGATI with the objective of "guaranteeing and promoting the protection, recovery, conservation and sustainable use of natural resources in indigenous lands and territories, ensuring the integrity of the indigenous heritage, improving the quality of life and full conditions for physical and cultural reproduction of current and future generations of indigenous peoples, respecting their sociocultural autonomy, under the terms of current legislation" (Almeida et al., 2020).

PNGATI is organized into seven axes, grouped into specific objectives, according to the themes of interest for the environmental and territorial management of indigenous lands. However, the tools for territorial and environmental management are ethno-mapping and ethno-zoning. The instruments are territorial and natural resource protection; indigenous governance and participation; protected areas, conservation units and indigenous lands; prevention and recovery of environmental damage; sustainable use of natural resources and indigenous productive initiatives; intellectual property and genetic heritage; training, exchange and environmental education (Guimarães, 2014, p. 173).

An essential instrument in supporting PNGATI is the Territorial and Environmental Management Plan for Indigenous Lands (PGTA). The plans' objectives reflect the specific visions of Indigenous Peoples for their lands, covering three main priorities: 1) Control and protection of the territory, including monitoring practices carried out by indigenous peoples, 2) Sustainable management of natural resources to promote food security and income generation, as well as the preservation, restoration and sustainable use of land and 3) Capacity building and institutional strengthening of local organizations. The autonomy and self-determination of indigenous peoples underlie participatory decision-making and the establishment of territorial planning, which contributes to strengthening indigenous territorial protection and control.

The preparation of PGTAs generally follows some guidelines and steps: community mobilization, technical consultants and partner institutions; socio-environmental and territorial diagnosis; and definitions on the use of natural resources and the actions required for implementation. The PGTAs have two methodological tools that operate in consecutive stages and are directly applicable to environmental initiatives: 1) ethnomapping: participatory mapping of areas of environmental, sociocultural and productive relevance for indigenous peoples, based on indigenous knowledge; and 2) ethnozoning: participatory planning instrument aimed at categorizing areas of environmental, sociocultural and productive relevance for indigenous peoples, developed from participatory mapping.

As for Free, Prior and Informed Consent, Brazilian legislation has provisions that support these instruments, including the Federal Constitution, Art. 231; Decree nº 5051/2004 promulgating ILO Convention 169, Decree nº 6040/2007, Act nº 13,123/15 and Decree nº 8772/16, the last two are specific for access to traditional knowledge associated with biodiversity. Regarding this last point, Table 6 of the 2nd SOI of Brazil presents consultation protocols developed since 2014 by indigenous peoples and traditional peoples and communities in Brazil.

Since 2014, some indigenous peoples and traditional peoples and communities in Brazil have developed their own consultation protocols:

Since 2014, some indigenous peoples and traditional peoples and communities in Brazil have developed their own consultation protocols. To date, the following protocols have been identified:

- Wajãpi Consent and Consultation Protocol (2014)
- Munduruku Consultation Protocol (2014)
- Mountain and Mangabal Consultation Protocol (2014)
- Consultation Protocol for the Peoples of the Xingu Indigenous Territory (2016)
- Consultation Protocol of the Munduruku and Apiaká Indigenous Peoples of the Planalto Santareno(2017)

- Juruna Consultation Protocol (Yudjá) of the Paquiçaba Indigenous Land of Volta Grande do Xingu (2017)
- Consultation Protocol of the Waimiri-Atroari People (2018)
- Tekoa Itaxi Mirim Consultation Protocol (2018)
- Kayapó-Menkrãgnoti Consultation Protocol (2019)
- Consultation Protocol of the Oiapoque Indigenous People (2019)
- Consultation Protocol of the Yanomami People and the Ye'kwana People (2019)
- Consultation Protocol of the Paraná People (2019)
- Consultation and Consent Protocol of the Mura de Autazes and Careiro da Várzea people (2019)
- Consultation and Consent Protocol of the Indigenous People of the Serra da Lua region, Roraima (2019)
- Consultation Protocol and Prior, Free and Informed Consent of the Irantxe-Manoki People (2019)
- Free, Prior and Informed Consultation Protocol of the Traditional Community of Rolim de Moura doGuaporé Quilombolas, Wajuru, Sakirabiar and Guarassuê Indigenous People (2019)
- Protocol of Prior Consultation of the Warao People in Belém, Pará (2020)

5.3.2. Traditional Communities

With their distinct and diverse cultural and economic relationships with land and forest, the inclusion of peoples and communities is also essential to REDD+ efforts. Traditional populations were officially recognized by the Federal Government by the National Policy for the Sustainable Development of Traditional Peoples and Communities (PNPCT) instituted in 2007 with Decree No. 6,040. The Federal Policy seeks to promote the sustainable development of Traditional Peoples and Communities, with an emphasis on strengthening and guaranteeing their rights in the territorial, social, environmental, economic and cultural spheres, as well as their recognition, with respect and evaluation of their identities, forms of organization and institutions. This is the main policy guiding the recognition and respect for safeguards relevant to the territories of traditional peoples and communities, thus contributing to the implementation of the Floresta+ pilot program and to the continuation of ENREDD + activities.

The actions and activities implemented by the policy take place in an intersectoral and integrated manner, coordinated by the National Council for the Sustainable Development of Traditional Peoples and Communities (CNPCT), carried out by the Decree of December 27, 2004 and reformulated by the Decree of July 13, 2006. The current structure of the CNCPT is defined in Decree No. 8750, of 9 May 2016.

The National Secretariat for Policies for the Promotion of Racial Equality (SEPPIR), through the Secretariat for Policies for Traditional Communities, is responsible for implementing the Policy aimed at specific groups: notably traditional peoples and communities with an African diaspora matrix and quilombolas relevant to the Amazon region. Currently, the Council is part of the structure of the Ministry of Women, Family and Human Rights.

The main objective of the CNPCT is "to coordinate the joint action of representatives of the Direct Public Administration and members of the non-governmental sector for the social, economic, cultural and environmental strengthening of traditional peoples and communities". Its main tasks are to propose principles and guidelines for government policies related to the sustainable development of traditional peoples and communities, as well as coordinating and monitoring the implementation of the National Policy for the Sustainable Development of Traditional Peoples and Communities.

Although public policies aimed at Traditional Peoples and Communities are recent in the Brazilian national structure, the foundation of these efforts was initially structured by Convention 169 of the International Labor Organization (ILO), which Brazil ratified in 2002 and deals with the rights of indigenous peoples and tribal groups

around the world. The Federal Constitution/88, which sought to advance and confirm the universal rights of Brazilians, also recognized specific rights of some traditional groups (quilombola communities) as well as indigenous peoples, notably the right to enjoy territorial rights and cultural activities. In addition, the Constitution establishes the protection of "The State shall protect the manifestations of popular, indigenous and Afro-Brazilian cultures, and those of other groups participating in the national civilizing process" (Art. 215, 1st), as well as "preserving diversity and the integrity of the country's genetic heritage and inspect the entities dedicated to the research and manipulation of genetic material" (Art. 225, 1, II).

It is estimated that around 4.5 million people are part of traditional communities in Brazil, representing around 25% of the national territory. Like indigenous peoples, traditional communities are also highly diverse and have historical ties to the land that are fundamental to their culture, both in terms of social organization and spirituality, as well as their economy. Generally, these communities are of mixed ancestry (African diaspora, indigenous and colonial Portuguese) and, like indigenous peoples, they are highly dependent on resources. Like indigenous peoples, these communities tend to live in precarious conditions, sometimes in extreme poverty, and tend to face higher illiteracy rates, higher infant mortality, higher maternal fertility rates and lower education rates.

Within traditional communities, there are a number of different identities related to their historical origins and local-based natural resource management systems, including quilombolas, rubber tappers, extractivists, caboclos, riverside dwellers, fishermen and others. This diverse group was legally defined in Decree No. 6,040, of February 7, 2000, stating that they are "culturally differentiated and recognized as groups that have their own forms of social organization that occupy and use territories and natural resources as a condition for their cultural, social, religious, ancestral and economic reproduction, using knowledge, innovations and practices generated and transmitted by tradition". They are also recognized in the CF/88, which states that "Traditional Peoples and Communities are groups that have cultures that are different from the predominant culture in society and recognize themselves as such".

In this sense, the National Policy for the Sustainable Development of Traditional Peoples and Communities (PNPCT), established by Decree No. 6,040/2007, is fundamental for providing political and social inclusion of traditional peoples and communities, as well as for establishing obligations to the public authorities regarding land tenure regularization of territories, as is the case of quilombolas.

Regarding the quilombola territories, the data were obtained from the systematization of official data from three institutions, two of which are governmental and a civil society organization that provide updated data, but in different forms, making it difficult to standardize[59]

[59] The INCRA database makes the data available in xls and shp formats and has a January 2019 update (INCRA-DFQ). In the case of the Fundação Cultural Palmares (FCP), the certificates issued to the remaining quilombola communities (CRQs) have an update published in the DOU of 04/22/2021 and in the Observatório Terras Quilombolas, in the database of the Comissão Pró-Índio de São Paulo (CPI-SP) presents the results of the monitoring of the regularization processes of quilombola lands, updated in March 2021

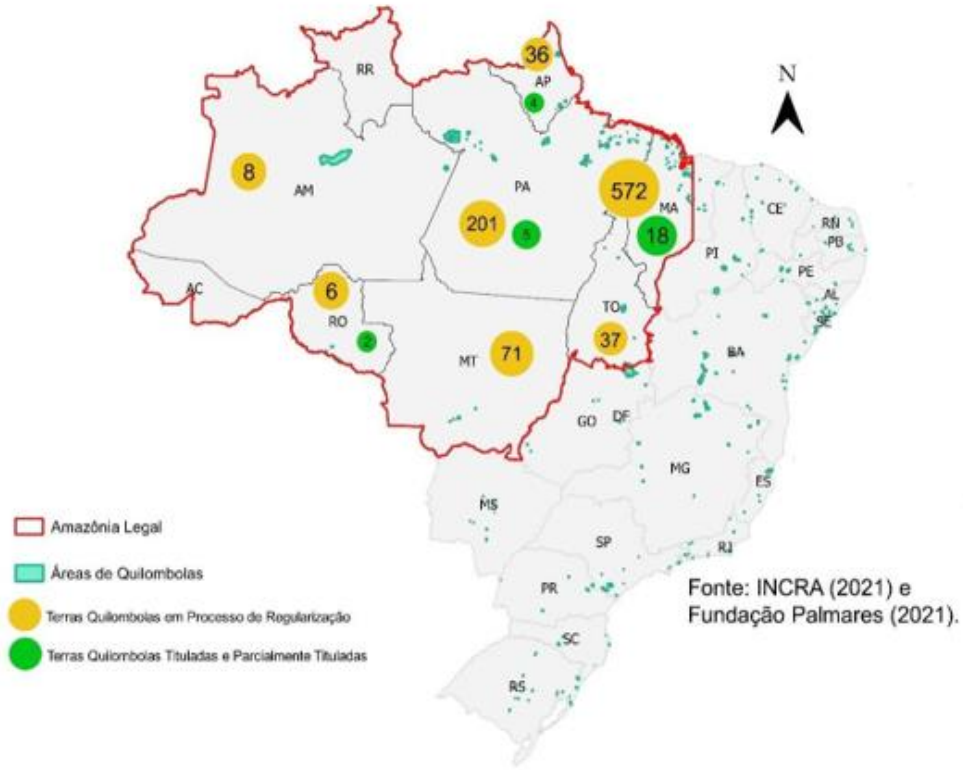


Figure 5-18. Map of Stages of Land Regularization Processes of Quilombola Communities in the Legal Amazon.

In the Legal Amazon, there are 960 quilombola territories in the process of land title regularization by INCRA. Only the states of Maranhão and Pará account for 83% of the total demand (Figure 5-18).

According to the data collected, the states of Rondônia and Amazonas have the smallest numbers of the total land in the land regularization process. Of the total, 97.3% are in identification and only 2.7% were titled. The titled quilombola territories are found in the states of Maranhão, Pará, Amapá and Rondônia. The states of Acre and Roraima do not have territories in the process of regularization. Most of the processes are concentrated in the certification stage with Fundação Palmares (Table 5-24). It appears that a problematic issue faced by quilombola communities is the slowness in completing their regularization processes, delaying the construction of collective projects and the promotion of ethno-development in these territories.

Table 5-24. Number of quilombola communities by state in the Legal Amazon registered in official government databases.

State	Regularization Processes Opened by INCRA	Certificate of Registration of Fund. Palmares	Identification and DelimitationTechnical Report (RTID) by INCRA	Recognition Ordinance by INCRA	DOU Decree	Partial Titulation	Titled	Total	% of Quilombola Lands in Identification
AM		2	6			0	0	8	100.0
AP	6	22	8			0	4	40	90.0
MA		549	14	3	6	3	15	590	97.5
MT		69	1		1	0	0	71	100.0
PA		186	6	4	5	0	5	206	97.6
RO		3	3			0	2	8	75.0

TO	1	25	8	1	2	0	0	37	100.0

Source: http://www.palmares.gov.br/?page_id=37551
Source: https://antigo.incra.gov.br/media/docs/quilombolas/andamento_processos.pdf Source: https://cpisp.org.br/direitosquilombolas/observatorio-terras-quilombolas/

Spatial Distribution

Maranhão and Pará have the largest number of quilombola communities that claim land rights over their lands. The largest areas in hectares destined are in cities in the states of Pará and Amazonas. The largest number of families residing in these territories are from Pará and Maranhão. Rondônia reported the lowest number of people residing in these areas. The database for defining the quantity of families and surface area is incomplete, underestimating the data and pointing to a more expressive number than reported by INCRA, updated in January 2019 (Table 5-25).

Table 5-25. Number of quilombola communities by state in the Legal Amazon registered in official government databases.
Source: https://antigo.incra.gov.br/media/docs/quilombolas/andamento_processos.pdf

State	Community Number (n)	Informed Number of Families	Informed Area (ha)
PA	206	11,395	1,153,661.44
AM	8	575	747,696.80
MA	590	7805	163,117.27
TO	38	635	130,683.03
RO	8	100	94,902.43
AP	40	366	57,775.45
MT	71	556	20,457.57

Quilombola communities have as their main representation the National Coordination of Articulation of Rural Black Quilombola Communities (CONAQ)[60]. CONAQ was created in 1996, as a nationwide movement, to represent and defend the rights of quilombos located in all regions and Brazilian biomes, in rural and urban areas.

In a study carried out by ECAM/CONAQ (2020), in 107 quilombola communities located in the states of Maranhão, Mato Grosso, Tocantins, Amapá, Rondônia and Pará, it appears that there is a balance between the number of women and men within the communities. However, most leaders are women, considering the leadership of the community and associations. In Tocantins, the male population is predominant. Meanwhile, Mato Grosso presents the opposite scenario.

Despite the progress made in some public sanitation and housing policies, the regional precariousness of some resources still stands out. Most of the houses are made of masonry, as a result of the implementation and access to programs such as Cheque Moradia, Minha Casa Minha Vida and the National Rural Housing Program (PNHR). However, quilombolas complain that such policies do not reach all communities, especially those accessed by river. The use of wood is predominant in Pará, Amapá and Rondônia. Mato Grosso appears with only 9.7%. Tocantins and Maranhão practically do not use this technique (ECAM/CONAQ, 2020).

In relation to households, the data show that a large part of quilombola houses is supplied by the public electricity network. The mobilization of the quilombolas made the Programa Luz para Todos reach the communities, which helps in the predominance of the type of energy available. River water consumption corresponds to 9% of the quilombola water source. Even when far away, rivers are essential for daily activities, such as washing clothes, producing flour, among other utilities. Some of the main points of attention raised by

[60] Available from: http://conaq.org.br/nossa-historia/. Accessed on: 01/06/2021

the communities were the lack of water in schools and the quality of water from wells, highlighted due to the use of pesticides in nearby plantations that possibly contaminate the soil and groundwater (ECAM/CONAQ, 2020).

Most of the quilombolas attended elementary school. Bolsa Família was an important mechanism to guarantee the permanence of children and adolescents in school. Children must enter schools at the age of 4 years. In many communities, they only enter with 6 or 7 years, either because access to school is difficult or because there are no schools within the quilombo (ECAM/CONAQ, 2020).

Quilombola territories have always been essentially productive spaces, as they produce for their own use/consumption and to exchange/trade in their commercial relations with other communities and with the city. Most quilombolas receive up to a minimum wage. The main source of income for the communities is the Programa Bolsa Família and agriculture. When looking at the total amount of income, most households receive up to 1 minimum wage (94%) and work in agriculture. A characteristic behavior of quilombola communities is income seasonality, as it is not constant and can change according to the time of year, planting and harvesting seasons (ECAM/CONAQ, 2020).

The role of women in income generation in quilombola communities is permeated by enormous challenges, as the income produced by women has little visibility and recognition and is often not included in the data on the composition of family income. Men, on the other hand, migrate to the nearest cities or even to large centers in search of work, whilst women remain in the quilombos and there they produce and guarantee their children's livelihood. In this context, the management of natural resources and planting in the fields, the social organization of the territory and the transmission of ancestral knowledge are supported by women (ECAM/CONAQ, 2020).

In the territories surveyed, it was highlighted that the size of families has been decreasing. Due to the lack of public policies, such as education, health and work, the quilombolas migrate to the city and this ends up changing the family scenario. The survey showed that most quilombolas do not return to their communities. Difficulties in obtaining formal work and study conditions are still among the main reasons why these members do not return. The lack of secondary schools within the communities and the need for a physical address to enroll in public schools, makes young people and families move to the city. These impediments make it impossible to continue in the quilombola territory (ECAM/CONAQ, 2020).

Quilombola youth are also a vulnerable group within these communities because they are not actively recognized in the means of production and income generation and because they move from their communities to the big cities. And this process has visible effects and is becoming increasingly common (ECAM/CONAQ, 2020).

Public policies for the quilombola territories

The land regularization policy of Quilombola Territories is of paramount importance for the dignity and guarantee of the continuity of these ethnic groups. Territorial issues have been the strongest pillar in the struggle of the quilombolas and their representative organizations. The legitimization of lands, such as the overlapping of military bases, restricted areas of environmental preservation, large state projects on quilombola territories are the most eminent threats in these locations (ECAM/CONAQ, 2020).

For these communities, the threats and violations of individual human, social, economic, cultural and environmental rights they have been facing have put their very survival at risk, resulting in the death of their leaders (ECAM/CONAQ, 2020).

The Brazil Quilombola Program aims to guarantee land tenure and promote the sustainable development of quilombola communities and among the programs instituted by the Ministry of the Environment is the “National Commission for the Sustainable Development of Traditional Peoples and Communities”, from which emerged the Decree No. 5,758, of April 13, 2006, which instituted the "National Strategic Plan for Protected

Areas - PNAP", which would have the broad and audacious objective of carrying out the integration of both protected areas and indigenous reserves and quilombola territories, forming large continuums of conservation of nature and socioeconomic development of traditional communities.

In 2016, the government created a Working Group with the purpose of proposing guidelines for the elaboration of the National Quilombola Environmental and Territorial Management Plan and proposing actions for its effective implementation (Ordinance No. 298).

Territorial and environmental management plans are planning instruments built by the community to collectively think about how to organize, use and guarantee the maintenance of each community's territory. These actions define the way each community must relate to the land, both in its material and symbolic perspective. The self-management of its own territory is of paramount importance for productivity, for the maintenance of traditions, for social organization, for income generation and for the sustainability of these spaces, avoiding impacts, especially environmental impacts, that could compromise extractivism, the family farming and access to water for families living there (N'Golo, 2020).

5.3.3 Extractivist Communities

Extractivism is a productive activity of peoples and communities, to a greater or lesser extent, combining this activity with the planting of food crops or the raising of small domestic animals to make up the family income. Among the segments of traditional peoples and communities, some have a more direct link with the practice of extractivism, which is at the base of their social, cultural and material sustenance and reproduction. Although plant and animal extraction is not the only source of income generation, as families and communities carry out other economic activities over time, this one stands out and makes them unique (MMA, 2017)[61].

In 2000, the SNUC was created, which consolidated the federal, state, municipal and private protected areas, which are divided into two categories: Integral Protection Units and Sustainable Use Units[62]:

The Full Protection Units have nature protection as their main objective in these units, which is why the rules and regulations are more restrictive. In this group, only indirect use of natural resources is allowed, that is, those uses that do not involve consumption, collection or damage to natural resources. The strict protection categories are: Ecological Station, Biological Reserve, Park, Natural Monument and Wildlife Refuge.

The Sustainable Use Units are areas that aim to reconcile the conservation of nature with the sustainable use of natural resources. In this group, activities that involve the collection and use of natural resources are allowed, but provided they are carried out in a way that the sustainability of renewable environmental resources and ecological processes is ensured. The sustainable use categories are: Area of Relevant Ecological Interest, National Forest, Fauna Reserve, Sustainable Development Reserve, Extractivist Reserve, Environmental Protection Area (APA) and Private Natural Heritage Reserve (RPPN).

Since 2000, the number and extent of UC has doubled, most of the new protected areas have been created in the Amazon biome, demonstrating government efforts to combat the advance of deforestation (Figure 5-19).

[61] https://www.socioambiental.org/sites/blog.socioambiental.org/files/nsa/arquivos/planafe_dez14_alt_final.pdf
[62] Available from: https://antigo.mma.gov.br/areas-protegidas/unidades-de-conservacao/o-que-sao.html.

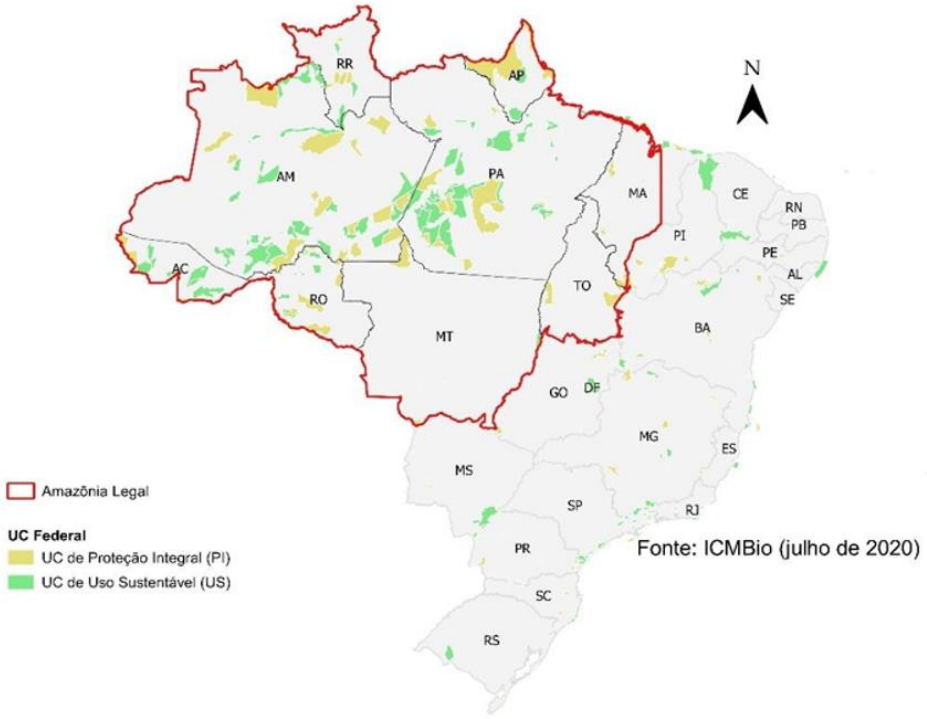


Figure 5-19. Map of Federal Conservation Units (UC) for Integral Protection and Sustainable Use.

In 2019, there were 128 Federal Conservation Units in the Legal Amazon, totaling about 64.1 million hectares, corresponding to 15.3% (Table 5-26).

Table 5-26. Categories of (UC) in the Legal Amazon. Source: ICMBio, 2021.

CU Categories in the Amazon Biome	Area (ha)	Number of Federal CU
Environmental Protection area	2,216,026.34	3
Area of Relevant Ecological Interest	18,931.16	3
Ecological Station	6,124,356.27	10
National Forest	17,717,251.37	34
National park	21,411,309.46	21
Biological Reserve	3,997,280.72	10
Sustainable Development Reserve	64,442.18	1
Extractivist reserve	12,594,017.75	46

Within the Protected Areas, extractivist communities are fundamental to forest conservation and federal and state legislation must guarantee opportunities for communities to manage natural resources in a sustainable manner. This category includes Extractivist Reserves (RESEX), National Forests (FLONAs) and State and Sustainable Development Reserves (RDS) (Figure 5-20).

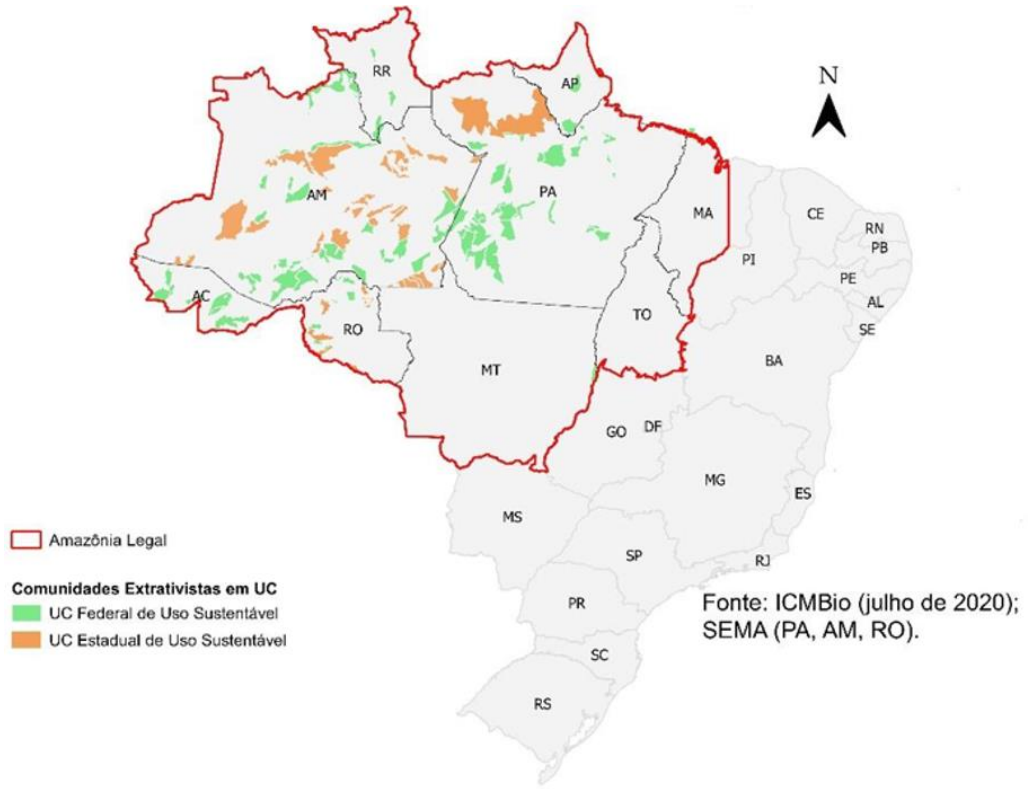


Figure 5-20. Map of Extractivist Communities in Conservation Units in the Legal Amazon.

In 2019, ICMBio carried out a census survey of extractivist communities residing in Federal Sustainable Use Conservation Units, in particular these categories Extractivist Reserves (RESEX), National Forests (FLONA) and Sustainable Development Reserves (RDS), in which 56,903 families were registered, totaling 300 thousand people and an area of 21.8 million hectares (Table 5-27).

Table 5-27 Categories of (UC) in relation to extractivist communities in the Legal Amazon, in 2019. Source: ICMBio, July 2019.

Category by State	CU Area (ha)	No. of Families Identified
Acre	3,129,361.47	4005
FLONA	429,052.05	32
RESEX	2,700,309.42	3973
Amazonas	9,043,920.71	4162
FLONA	5,504,545.71	1811
RESEX	3,539,375.00	2351
Amapá	992,763.65	1412
FLONA	460,359.14	71
RESEX	532,404.51	1341
Maranhão	681,047.78	4580
RESEX	681,047.78	4580
Pará	7,042,483.48	29850
FLONA	2,422,980.91	1532
RDS	64,442.18	305

Category by State	CU Area (ha)	No. of Families Identified
RESEX	4,555,060.40	28013
Rondônia	879,896.74	562
FLONA	443,335.65	181
RESEX	436,561.10	381
Tocantins	9,070.60	235
RESEX	9,070.60	235
Global Total	21,778,544.45	44,806

Law No. 9,985/2000 defines the Management Plan as a technical document through which, based on the general objectives of a Conservation Unit, its zoning and the norms that should govern the use of the area and the management of the natural resources. All conservation units must have a Management Plan, which must cover the area of the Conservation Unit, its buffer zone and ecological corridors, including measures to promote its integration into the economic and social life of neighboring communities (Art. 27, §1).

The Management Plan aims to make the Conservation Unit comply with the objectives established in its creation; define specific management objectives, guiding the management of the Conservation Unit; promote the management of the Conservation Unit, guided by available and/or generated knowledge. Although the Amazon UC's management efficiency has improved, many protected areas still do not have a management plan, although they are mandatory. Management plans are a prerequisite for the sustainable use of local communities (mainly traditional and indigenous) to continue harvesting, fishing, agriculture.

5.4 LIVELIHOOD

5.4.1 Family Farming in Legal Amazon

Social Aspects of Family Farming

The Legal Amazon has been the focus of debates at national and international levels, above all, about its preservation and the use of land for economic and rural activity. Rural activity in the Legal Amazon is directly linked to the family environment (França et al, 2006).

Family Farmers are responsible for producing a large part of the food consumed by the Brazilian population. In the states that belong to the Legal Amazon, the largest number of rural establishments that fall into the category of Family Farming is found in the States of Pará and Maranhão, with 32% and 25% respectively (Figure 5-21).

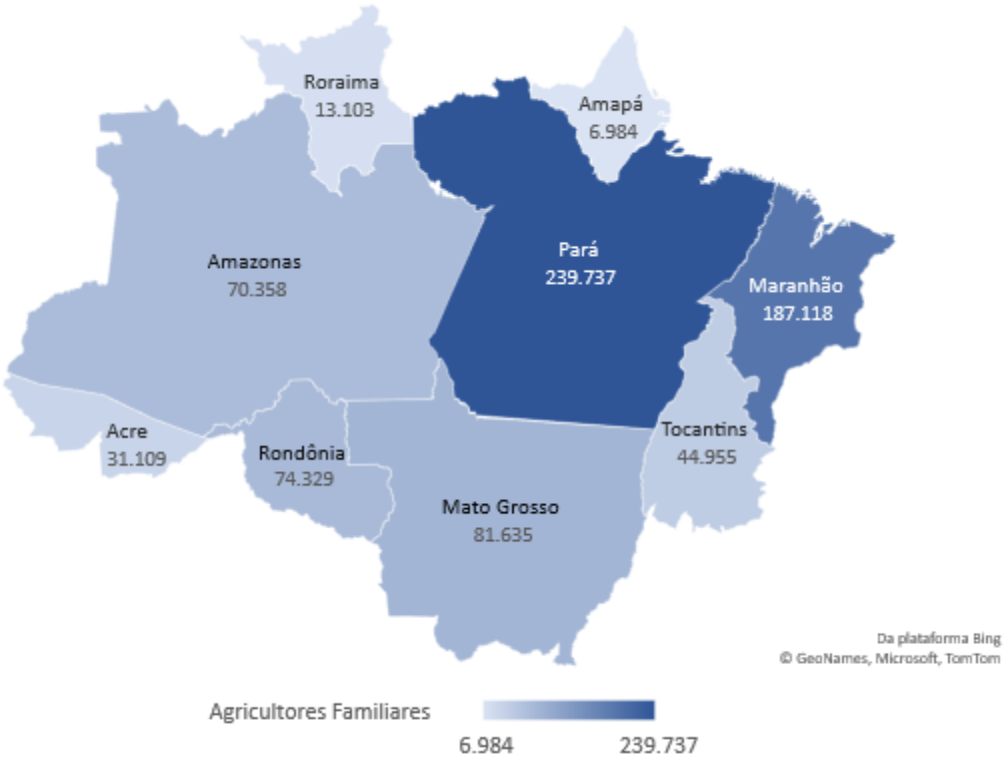
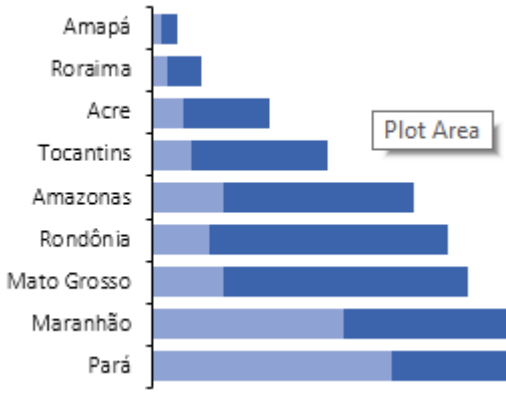


Figure 5-21. Number of rural Family Farming establishments by state in the Legal Amazon. Source: IBGE, 2017.

Regarding the management of rural properties, men are predominant over the number of Family Farming establishments in all states of the Legal Amazon, with establishments managed by women, being approximately 20% of the number of men (Figure 5-22), as seen above and that should be considered for an approach that promotes gender equality.

Despite a relatively small proportion of women who manage rural properties, they are directly involved in the productive activities of Family Farming, which according to Silva and Schneider (2010), in several studies, reinforce the role of unpaid supporting women.

In the Amazon, in riverine families of family production, fishing is a common activity for these families, although almost exclusively male. In these cases, in the division of work, the woman is the sole responsible for part of the agricultural activities, including the harvesting, cleaning and separation of grains, fruits and vegetables, among others. However, when the manager responsible for the family rural establishment is identified, the man is the one who assumes this role, even though both men and women work together



	Pará	Maranhão	Mato Grosso	Rondônia	Amazonas	Tocantins	Acre	Roraima	Amapá
Women	50 727	40 238	14 972	11 870	15 032	8 128	6 454	2 955	1 716
Men	189 010	146 880	66 663	62 459	55 326	36 827	24 655	10 148	5 268

Women Men

Figure 5-22. Number of agricultural establishments in Family Farming by gender of managers in the Legal Amazon States. Source: IBGE, 2017.

In general, many family farmers residing in the Legal Amazon are of "dark-skin" color/race, however, there are specific differences regarding this aspect between the states in the region. The groups of Family Farmers called "yellow" are mostly present in the states of Pará and Maranhão.

Amazonas has the largest number of Family Farmers called "indigenous", this represents about 53% of farmers in this category in the entire Legal Amazon, followed by Roraima, Pará and Maranhão. However, family producers called "blacks", which are present in greater numbers in the states of Maranhão and Pará with 32 and 33% respectively.

The difference in the number of indigenous family farmers is related to the fact that Amazonas is the state in the Legal Amazon that has the largest indigenous population (IBGE, 2010). In the case of "black" family farmers, the state of Maranhão is the Brazilian state with the largest number of quilombola lands regularized or in the process of regularization, and in the Legal Amazon, the state of Pará holds the second largest number of quilombola lands under these conditions (CPISP, 2021). The states of Maranhão and Pará are the states with the highest density of black people in the Legal Amazon region (IBGE, 2010).

Table 5-28 Number of agricultural and livestock establishments of Family Farmers by race or color in the States of Legal Amazon. Source: IBGE, 2017.

States	Race or Color					Global Total
	Yellow	White	Indigenous	Darck-skinned	Black	
Acre	247	6,201	1,979	20,031	2,408	30,866
Amapá	68	977	805	3,935	1,021	6,806
Amazonas	295	8,495	14,975	39,861	3,976	67,602
Maranhão	1,250	31,970	1,842	112,328	25,168	172,558
Mato Grosso	788	36,529	851	35,894	7,427	81,489
Pará	1,614	41,811	2,183	164,268	26,052	235,928
Rondônia	456	28,825	409	37,868	6,509	74,067
Roraima	61	1,660	4,878	5,487	824	12,910
Tocantins	362	12,245	294	24,895	6,670	44,466

As for the level of education of Family Farmers, the states of Acre and Maranhão stand out for having the largest number of producers who have never attended school. This is also a common characteristic for a considerable part of Family Farmers in all states in the Legal Amazon (Table 5-29).

Table 5-29 Level of education of Family Farmers in the States of the Legal Amazon. Source: IBGE 2017

States	Never attended school	Literacy class	Regular of elementary school or 1st grade	Regular high school or 2nd grade	Higher - graduation	Other education modalities	Global Total
AC	8,777	3,824	6,814	3,786	816	31,109	55,126
AP	1,444	728	2,283	1,124	173	6,984	12,736
AM	15,225	9,667	19,232	9,802	1,247	70,358	125,531
MA	48,813	42,097	36,969	15,553	1,995	187,118	332,545
MT	9,953	5,457	12,155	13,231	4,086	81,635	126,517
PA	42,156	35,389	82,362	23,398	3,824	239,737	426,866
RO	9,070	5,545	13,454	9,049	2,155	74,329	113,602
RR	3,196	1,681	3,466	2,043	474	13,103	23,963
TO	7,593	6,094	8,111	6,573	1,574	44,955	74,900

In the other states, most of the farmers completed only basic elementary education, except in the state of Mato Grosso, which is divided between elementary and high school.

This characteristic can hinder the adhesion of a considerable number of Family Farmers in the Legal Amazon to rural credit programs, rural social programs OR payment for services programs such as the Floresta+ Amazônia Pilot Project.

Another relevant aspect is the lack of specialized technical assistance for Family Farmers in the Legal Amazon. Most farmers do not have any type of technical assistance regardless of which State they belong to, however, in some States this characteristic is more expressive, such as Pará and Maranhão, where the number of farmers who do not receive any type of technical assistance is approximately 30 times the number of Family Farmers receiving technical assistance (Table 5-30).

Thus, the low level of education and the lack of specialized technical assistance can make it difficult for rural producers to adhere to environmental service programs.

Table 5-30 Family producers in the States of the Legal Amazon who receive specialized technical assistance. Source: IBGE(2017).

States	Not receiving		Receiving	
	Men	Women	Men	Women
Acre	21,979	5,792	2,676	662
Amapá	4,502	1,499	766	217
Amazonas	49,288	13,530	6,038	1,502

Maranhão	142,496	39,214	4,384	1,024
Mato Grosso	58,045	13,379	8,618	1,593
Pará	179,726	48,694	9,284	2,033
Rondônia	51,230	10,168	11,229	1,702
Roraima	9,040	2,674	1,108	281
Tocantins	32,786	7,269	4,041	859

Economic Aspects of Family farming

The territorial extension of the Legal Amazon is of continental proportions, and each State has its specific characteristics regarding economic contexts. State or micro-regional productive capacities within each state allow them a wide range of production, which ranges from agricultural and livestock production, agriculture, fishing and extractivist activities.

Regarding the pasture area, Brazil has 111.8 million ha, of which 53.2 million ha (47.6%) are in the Amazon, where the states with the largest pasture areas are the states of Mato Grosso, which has 21.9 million and Pará, which has 13.6 million ha of cultivated pasture, whose support capacity is 1.10 and 1.12 AU[63]/ha (Brazilian Institute of Geography and Statistics - IBGE, 2018), respectively.

The animal carrying capacity of pastures in Brazil is about 1.15 AU/ha, while in the Amazon the average carrying capacity is 1.4, slightly above the national average (IBGE, 2018), with a variation of 0.4 to 3.8 (Smeraldi and May, 2008), indicating a wide variation in the herd rearing and management system. Within the states that make up the Legal Amazon, the lowest animal carrying capacity is that of the state of Amapá (0.19 AU/ha) and the highest is that of the state of Rondônia, with 1.65 (IBGE, 2018).

Regarding agricultural production in the Legal Amazon, in the states of the Brazilian Legal Amazon in 2019, the total area destined for the harvest of permanent crops was 703,984 thousand hectares in the national territory. Açaí is the product with the largest area for harvesting (194,987 thousand ha), followed by palm oil (164,965 thousand ha), cocoa (151,812 thousand ha) and lastly rubber obtained from coagulated latex (26,297 thousand ha) (Figure 5-23).

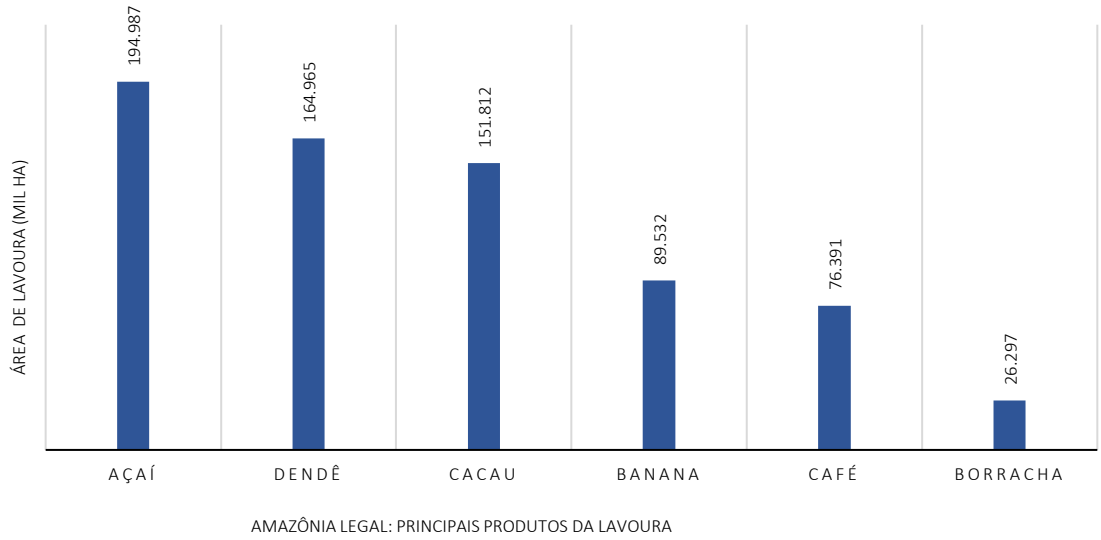


Figure 5-23 Legal Amazon: area destined to harvest (thousand hectares) for the main products of permanent crops in2019. Source: adapted from IBGE, 2021

[63] Live weight of 1 AU = 450 kg

In 2019, the states of Pará and Rondônia were the ones that contributed the most to the areas destined to the harvest of permanent crops, respectively with 389,529 thousand hectares and 68,418 thousand hectares (together, these areas represent 457,947 thousand hectares of the area destined to harvest for the year 2019) as shown in Table 5-31.

Table 5-31 Harvests of permanent crops in the states in the Legal Amazon in 2019. Source: adapted from IBGE, 2021.

States	Agricultural Production - Permanent Cropping (tonnes)					
	cocoa	coffee	banana	dendê	rubber	açaí
Acre	-	1,201	8,350	145	796	100
Amazonas	1,243	221	6,773	270	31	5,246
Amapá	-	-	1,694	-	-	-
Roraima	12	-	6,583	140	-	600
Rondônia	9,371	61,800	6,350	-	-	268
Tocantins	-	-	12,021	-	1,025	176
Pará	140,549	271	35,967	164,410	866	188,015
Mato Grosso	637	12,898	7,083	-	22,070	-
Maranhão	-	-	4,711	-	1,509	582

Regarding the cultivation of açaí, Pará is the largest producer of açaí at the national level, with a turnover of more than R$ 460 million. In the State of Pará, the largest production of the fruit is in the municipalities of Limoeiro do Ajuru and Oeiras do Pará (Vegetable Extraction and Forestry Production (PEVS) data from 2019 by IBGE). Most of the planting takes place in the northeast of Pará – including the Salgado region, responsible for 100,200 tons in 2019. The municipalities of Limoeiro do Ajuru, which registered 42 thousand tons, and Oeiras do Pará, 26,500 tons, were the ones that stood out the most.

The Marajó region is also relevant in the production of açaí, having been responsible for 37 thousand tons of the fruit in 2019. In the municipalities of Marajoara, a large part of what is cultivated is concentrated in Afuá (9,300 tons), Muaná (7 thousand tons), São Sebastião da Boa Vista (6,300 tons) and Ponta de Pedras (6 thousand tons) (IBGE, 2019).

In the states of the Brazilian Legal Amazon in 2019, the total area destined for harvesting temporary crops is 20,529,561 million hectares (IBGE, 2019). Soy is the product with the greatest extension of harvested area in the Legal Amazon (12,583,419 million hectares), followed by corn in grain (6,238,299 million hectares) and finally watermelon (23,118 thousand hectares) (Figure 5-24).

In 2019, the states of Mato Grosso and Tocantins were the ones that contributed the most to the areas destined to the harvest of temporary crops, respectively with 15,377,080 million hectares and 1,382,374 million hectares (together, these areas represent 16,759,454 million hectares of the harvested area for the year 2019) as shown in Table 5-32

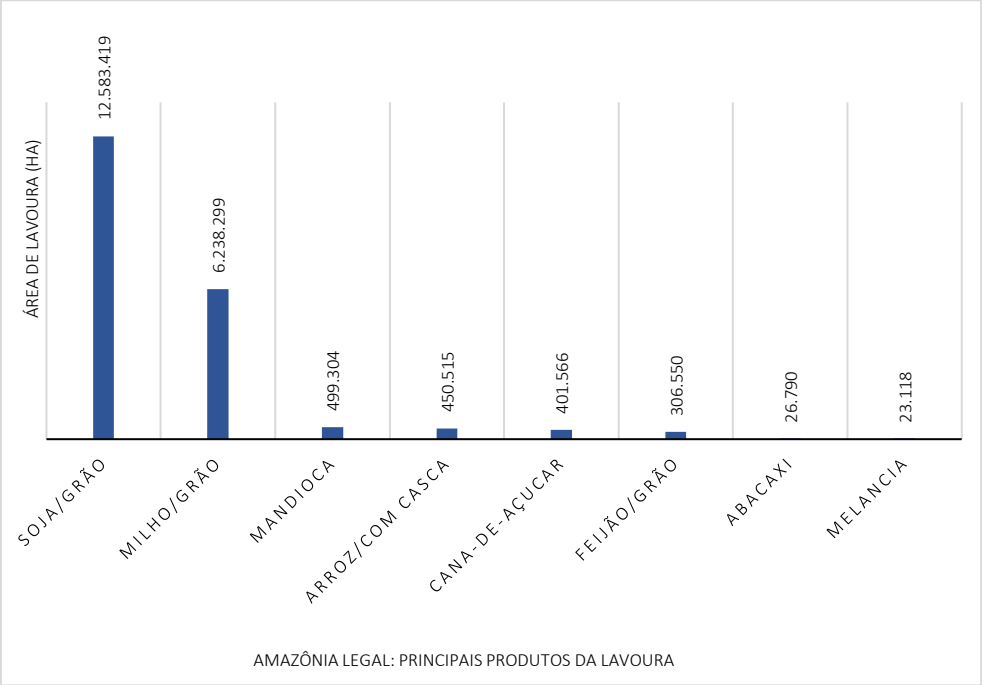


Figure 5-24 Harvested area (millions of hectares) for the main products from temporary crops in 2019 (Source: adapted from IBGE, 2021).

Table 5-32 Harvested area (million hectares) of temporary crops in the Legal Amazon in 2019. Source: adapted from IBGE, 2021.

States	Agricultural productions – temporary cropping							
	pineapple	Rice with pelt	Sugarcane	Bean/grain	manioc	watermelons	Corn/grain	soy/grain
Acre	517	3,750	460	5,385	26,650	1,315	28,840	1,590
Amazonas	2,799	488	351	1,489	76,893	3,330	2,856	2,500
Amapá	1,146	825	411	975	10,125	562	1,248	18,493
Roraima	410	12,400	210	843	6,342	1,509	9,621	31,730
Rondônia	766	43,325	2,517	16,548	22,286	1,024	225,327	344,551
Tocantins	4,286	123,022	39,179	29,689	14,376	7,657	259,121	905,044
Pará	14,032	38,241	14,920	27.,464	262,021	3,970	259,122	577,764
Mato Grosso	1,516	136,757	296,113	170,289	19,887	2,090	5,026,279	9,724,149
Maranhão	1,318	91,707	47,405	53,868	60,724	1,661	425,885	977,598

5.4.2 The Rural Environment registry

The CAR (Rural Environmental Registry) is a mandatory electronic national public registry for all rural properties that was established by the Forest Code (Law 12.651/2012). The purpose of this instrument is to create a record of all rural properties in the country that integrate relevant environmental information on properties into a database to support monitoring and combating deforestation, as well as economic and environmental planning for private properties. The properties are registered by the National Rural Environmental Registry System (SICAR), which is the system responsible for issuing the rural property registration receipt. Proof of property ownership is not required to register a property's environmental information in the CAR. It is not a property registry system but a self-declared environmental registry.

In the CAR, data regarding Permanent Preservation Areas (APPs), Legal Reserves (RLs) and restricted use areas within the property are recorded, which are as follows:

- APP: area destined to preserve water resources, soil and gallery forests and ciliary forests; cannot be used for economic exploitation;
- RL: area covered by natural vegetation that can be sustainably exploited within the limits established by the biome where the property is located. In the Legal Amazon, a property must have a total of 80%of RL in forest areas and 35% in cerrado areas. In other biomes, the percentage is 20%.
- Area of restricted use: includes wetlands and plain wetlands, areas with a slope between 25° and 45° and coastal zone areas.

Rural producers are legally obliged to recover areas illegally deforested in accordance with the law and are responsible for rectifying any deficiencies that exist in their Permanent Preservation Areas (APP), Legal Reserve (RL) or restricted use areas. If forest restoration is necessary, the owner can join the Environmental Regularization Program (PRA), which offers some benefits such as a reduction in the APP area to be recovered in consolidated areas, the possibility of moving the RL to another rural property; restoration of RL by planting native and exotic species interspersed in an agroforestry system; suspension of administrative sanctions related to suppressions prior to July 22, 2008. Producers may also have access to rural credits and government incentive programs for production and marketing. Environmental regularization is considered essential for Brazil to achieve the goals of reducing deforestation and restoring degraded areas.

The data for the reference line, used here, were provided by UNDP based on data obtained from SICAR, in collaboration with SFB/MAPA, and refer to surveys carried out in January 2021 indicated with the status of active, pending or suspended. As for the type, the records indicated as rural property and with an area less than or equal to 4 fiscal modules were included in the analysis, as these are the eligible records for the Pilot Project.

The concept of fiscal module was introduced by Law nº 6,746/1979 and expresses the minimum area necessary for a productive unit to be economically viable. The definition of family farmer and rural family entrepreneur given by Law No. 11,326/2006 also includes the concept of fiscal module, by establishing that, among other requirements, it does not hold, in any capacity, an area larger than 4 fiscal modules. In the Native Vegetation Protection Law (Law No. 12,651/2012), the value of the fiscal module is used as a legal parameter for its application in different contexts, such as the definition of benefits attributed to small property or rural family ownership; in the definition of minimum ranges for the restoration of Permanent Preservation Areas; maintenance or restoration of the Legal Reserve, among others.

The value is fixed by INCRA for each municipality considering: (a) the predominant type of exploration in the municipality (fruit and vegetable, permanent culture, temporary culture, livestock or forestry); (b) the income obtained in the predominant type of exploration; (c) other explorations existing in the municipality that, although not predominant, are expressive in terms of income or area used; (d) the concept of "family property".

The dimension of a fiscal module varies according to the municipality where the property is located (Figure 5-25). The value of the fiscal module in Brazil ranges from 5 to 110 hectares. The Legal Amazon concentrates the municipalities with a fiscal module greater than or equal to 100 ha located in the States of Acre (18 municipalities), Amazonas (39 municipalities), Mato Grosso (41 municipalities) and Roraima (7 municipalities) (Landau et al. , 2012).

Between 2013 and 2020, 40% of forest loss occurred in areas without land definition, considering data from PRODES/INPE consolidated from 2013 to 2019 and the estimate for 2020 released in November 2020. Almost half of this total occurred in areas that had CAR in 2020, equivalent to 18% of deforestation in the Amazon in the period (Brenda et al., 2021). This indicates that these would be priority areas for action in environmental inspection and CAR validation. Since the CAR is a self-declaratory record, records in areas not intended and not regularized from the land tenure point of view, by themselves, do not grant the registered area and its declarant any right of possession or ownership.

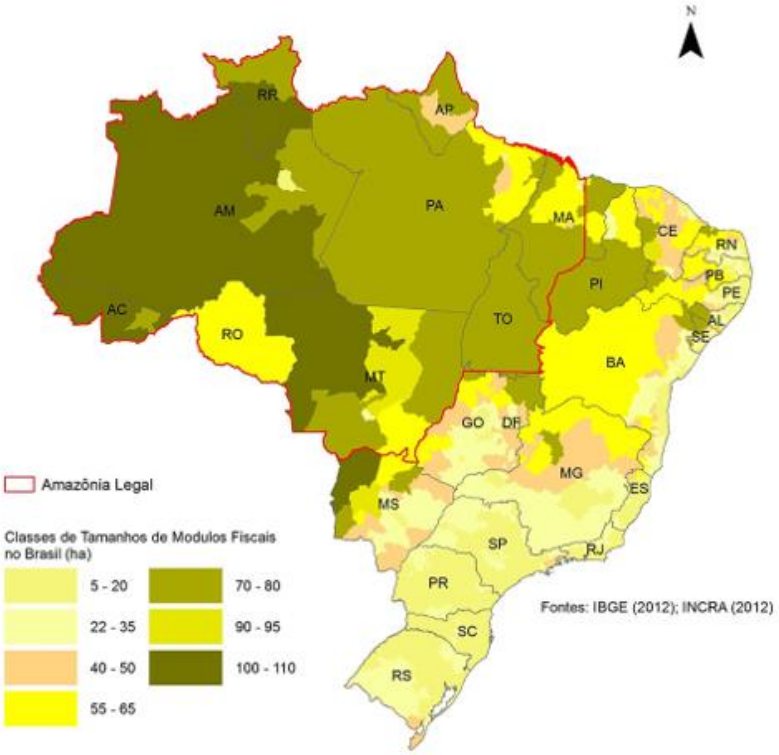


Figure 5-25 Dimension of Fiscal Modules in Brazil. Source: https://www.embrapa.br/codigo-florestal/area-de-reserva-legal-arl/modulo-fiscal

From the total of records, it appears that, in the Legal Amazon, 89.2% of registered rural properties have up to 4 fiscal modules and that correspond to 26.7% of the total area (Table 5-33). Which is to say that the option for smaller properties, despite reaching the largest number of beneficiaries, which would be socially desirable, would cover only ¼ of the area of rural properties and by extension of the area that could be compensated by payments.

A study on estimates of the legal reserve deficit points out that with the regularization of only 117 properties in Pará and 1169 in Mato Grosso, it would be possible to reduce by 50% the total Legal Reserve liabilities in both states. This indicates that the implementation strategies of the Native Vegetation Protection Law through additional government and market actions could be carried out at a low cost by targeting a reduced number of actors (Rajão et al., 2018).

Table 5-33 Rural Properties located in the Legal Amazon and registered in the CAR, by CAR status. Source: SICAR/PostreSQL

CAR Status	Rural property	Rural property

	(Any size)		Up to 4 fiscal modules	
	Number of registrations	Total Area of rural properties (ha)	Number of registrations	Total Area of rural properties (ha)
Active (AT)	787,320	238,434,853	705,426	59,326,320
Pending (PE)	124,483	55,879,581	108,514	20,866,836
Suspended (SU)	1,943	10,750,119	1,553	1,158,097
Total	**913,746**	**305,064,553**	**815,493**	**81,351,253**

* Status: active, pending and suspended
** as per owner/squatter declaration, excluding legal overlapping limits

The number of properties that had been analyzed and were awaiting environmental regularization corresponded to 0.41% of the properties up to 4 fiscal modules (f.m.) and 0.33% of the area up to 4 f.m. The properties analyzed without pending items corresponded to 0.14% of the properties up to 4 f.m. and 0.16% of the area up to 4 f.m. (Table 5-34). If the properties already analyzed, that is, validated, are added together, the total reaches the amount of 4,501 records and a total area of properties of approximately 400 thousand hectares (i.e., in theory, with a surplus of at most 80 thousand hectares). These values would be much lower than the targets established by the project, which provides for payment to 80,000 beneficiaries and 380,000 hectares of surplus native vegetation. Therefore, the main risk that can lead to the non-implementation of the project has been identified.

Table 5-34 Properties up to 4 fiscal modules, by condition of the property. Source: SICAR/PostreSQL.

Condition of the property	Number of registrations	Total Area of Rural Properties (ha)
Awaiting analysis	603,386	59,055,166
Analyzed by automatic filter	103,074	10,330,386
Under analysis	10,680	2,196,787
Analyzed with pendency	93,852	9,371,068
Analyzed, awaiting environmental regularization	3,366	270,626
Analyzed with no pendency	1,135	127,220
Total	815,493	81,351,253

* CAR status: active, pending and suspended.

When comparing the states (Table 5-35), Maranhão stands out for the number of records analyzed automatically, with 59.6% of its records processed. Pará had the highest number of records with pending issues, corresponding to 55.7% of records in that state. If the records with the status of "analyzed-awaiting environmental regularization" and "analyzed with no pendency" are added together, the state that stands out from the rest is the state of Rondônia, with 2,372 records in these situations, which corresponds to 52.7% of the total records available throughout the region covered by the project. It is worth mentioning the very low number of suitable records in the states of Amazonas, Pará, Maranhão, Roraima and Tocantins. The states of Acre (with 402 suitable records), Pará (with 445 suitable records) and Mato Grosso (with 1,212 suitable records), in this ascending order, are the only states, apart from Rondônia, that present several records with any significance.

Table 5-35 Number of registries of rural properties with an area of up to four fiscal modules registered in the CAR (qty.),by Property Condition, Legal Amazon. Source: SICAR/PostreSQL.

Property condition	AC	AM	AP	MA	MT	PA	RO	RR	TO	Total
Awaiting analysis	28,226	28,616	2,622	118,403	112,403	136,233	106,695	4,997	65,191	603,386
Analyzed by automatic filter	0	21,909	2,894	70,535	0	0	2,746	4,620	370	103,074

Under analysis	6,102	2,593	0	1	220	977	765	0	22	10,680
Analyzed with pendency	2,961	2,362	0	2	194	75,887	12,442	0	4	93,852
Analyzed, awaiting environmental	389	4	0	0	585	223	2,155	0	10	3,366
regularization	13	11	0	1	627	222	257	0	4	1,135
Analyzed with no pendency	37,691	55,495	5,516	188,942	114,029	213,542	125,060	9,617	65,601	815,493

Considering the results of the 2016 Agricultural and Livestock Census as the empirical reference for analyzing the agrarian structure of the region, the number of family farm properties recorded in the Census was compared with the total registrations in the SICAR of properties up to 4 fiscal modules (Table 5-36). Although this is not an accurate comparison, since the data extracted from the census are not specialized micro data, it is still supposed that, in theory, these two totals should be approximated if most family farmers had registered in SICAR.

Table 5-36 Quantitative comparison between total registrations in the CAR and of family farming properties in the 2016 Agricultural and Livestock Census by state. Source: IBGE/Agriculture and Livestock Census 2017. https://sidra.ibge.gov.br/tabela/6753.

Federation Unit	Family Farming	% total	CAR	Difference CAR - Census	%
Acre	31,109	83.3	37,691	6,582	21.2
Amapá	6,984	82.1	5,516	-1,468	-21.0
Amazonas	70,358	86.9	55,495	-14,863	-21.1
Maranhão	187,118	85.1	188,942	1,824	1.0
Mato Grosso	81,635	68.8	114,029	32,394	39.7
Pará	239,737	85.1	213,542	-26,195	-10.9
Rondônia	74,329	81.3	125,060	50,731	68.3
Roraima	13,103	77.8	9,617	-3,486	-26.6
Tocantins	44,955	70.5	65,601	20,646	45.9

The states that would have the largest discrepancies in property registration and family possessions would be Roraima, Amazonas, Amapá and Pará, in that order. On the contrary, five other states registered properties up to 4 modules that are above the 2017 Agricultural and Livestock Census survey. The biggest positive differences would be in the states of Rondônia, Tocantins, Mato Grosso with more than 20 thousand records above expectations, in that descending order. The states whose records are closest to the values disclosed in the Census are Maranhão and Acre.

In the case of Maranhão, this result may be linked to the project[64] developed by the state and which received the support of resources from the Amazon Fund in December 2017, in the amount of R$ 40.5 million, intended to support the registration of the Rural Environmental Registry in 182,500 rural properties in 217 municipalities.

The cases of Roraima, Amazonas and Amapá stand out from the group of states due to their high discrepancies. On the one hand, these values most likely portray the declaratory nature of the registry, on the other hand, the existence of many agents who intend to claim ownership of medium and large properties and which would not be detected by the census sampling since they do not reside in the areas. As the CAR is the main access mechanism to potential beneficiaries of Modalities 1 and 2, it could mean the exclusion of a large portion of this public for the state of Roraima (26.6%), Amazonas (21.2%) and the Amapá (21.0%).

[64] http://www.amazonfund.gov.br/pt/projeto/Mais-sustentabilidade-no-campo/#

Another relevant fact that may have contributed to the discrepancy in the CAR registration number would be the low insertion of records of individual lots of traditional settlement projects, under the responsibility of INCRA. In the response[65] of 04/30/2021 to the query made to SR15, this INCRA unit in Amazonas reported that the state has 107 projects, in addition to a municipal settlement and recognized Conservation Units. Of the 107 settlements, 35 are Traditional Projects, PA Modality - Settlement Project, parceled perimeter, 23 Special Projects of the PAF Modality - Forest Settlement Project and PDS - Sustainable Development Project, 1 PCA - Casulo Settlement Project and 49 are Special Projects of PAE Modality - Agroextractivist Settlement Project.

Although all 107 settlement projects in Amazonas are included in the SICAR - National Rural Environmental Registry System, these records are in the perimeter form, in the AST module - Settlement. The inclusion of these settlements, in this form, aimed only to ensure the established deadline. With the inclusion of the settlements in the perimeter format, it would have been possible to guarantee the inclusion of approximately 42,472 families. Of the 35 traditional settlements, 25 received individual CAR action. According to a survey carried out in May 2019, a total demand of 21,552 parcels was identified, of which 7,917 had already been entered into the SICAR, leaving 13,635 (63.2%) to be included.

In consultation with the SICAR made on 04/29/2021, INCRA/AM reported that 4,617 occurrences of registrations in INCRA's CNPJ were identified for the state of Amazonas, with the remainder probably carried out by partner institutions in the module IR - Rural Property. According to the superintendence, the years in which the greatest CAR action took place were the years 2015 and 2016. For the extinct Environmental Service of INCRA SR(15)AM, the year of greatest activity was 2016, given the existence of release of resource. After that year, there were some specific actions. Although there were several actions with partner intuitions, the adhesions were not the same in all places. In the case of settlements, the actions with the greatest results for parcels were those carried out within the settlements.

5.4.3 Custos de oportunidade

Modalities 1 and 2 could be classified as typical Environmental Services Payments (PES) and the risks of their implementation should be analyzed in light of the knowledge already accumulated about the effectiveness of PES schemes. Generally, appropriate contexts for a given PES contain a mixture of factors, including those of an economic nature. There are, therefore, economic pre-conditions that determine whether or not a PES scheme will succeed in practice. One of these conditions concerns the amount paid for environmental services, that is, whether this amount exceeds the costs of provisioning the expected environmental services. If the expected environmental gains are less than the costs, especially the opportunity cost, the PES runs the risk of not materializing. The economic benefits of conservation, and the corresponding amount paid for them, are not always sufficient to attract the landowner to provide the intended environmental service (Wunder et al., 2020).

The cost of forest conservation can be estimated as the opportunity cost[66] of the land (applicable for Modality 1), and the forest recovery costs (in the case of Modality 2) as the estimates of necessary expenses with fencing, inputs and labor work (Young et al., 2016). These values should be seen as components of the PES cost, for direct payments, since the transaction, inspection and monitoring costs would, in theory, be assumed by the accredited organization. In the final report of the UNDP Project BRA/11/022[67], the median value found was R$ 403/ha/year. In other words, a hypothetical PES that paid up to R$ 403/hectare/year could offset the opportunity cost in about half of the area of Brazilian rural properties. This cost is lower in the North and Northeast regions (especially in the interior), and it is higher in the South, Southeast and part of the Midwest (Figure 5-26).

[65] https://sei.incra.gov.br/sei/controlador_externo.php?acao=documento_conferir&id_orgao_acesso_externo=0, verifier code 8772770 and CRC code F23DF3FD.

[66] the profit that the provider loses for adopting an alternative activity that is not harmful to the maintenance of the environmentalservice in question

[67] Technical support to the Preparatory Process of the United Nations Conference on Sustainable Development Rio+20 and development of its results (YOUNG et al., 2016).

Considering the official Brazilian inflation index, this amount updated according to the IPCA[68] index would be R$596.42 with an accumulated inflation of 47.99% in the period from Jan./2013 to Jan./2020.

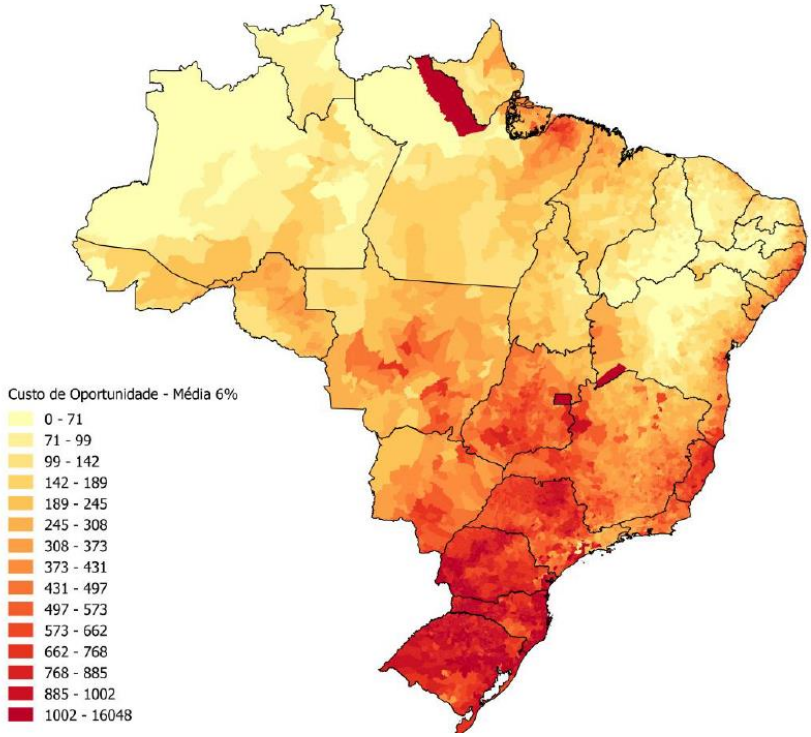


Figure 5-26 Earth Opportunity Cost in R$/hectare/year, at 2013 prices – average of the proposed models. Source: Young *et al.*, 2016.

As for the direct costs of forest recovery, that is, the municipal costs of fencing and forest recovery, the median value of these annual costs was R$ 7,466 per hectare, excluding the costs of transporting inputs and administration, and R$ 8,900 per hectare when these costs were included. The maximum values changed from R$ 10,500 to R$ 12,400 when considering the costs of transporting inputs and administration.

In a previous study, made at the request of the Ministry of the Environment (Wunder et al., 2008), with a specific focus on the legal Amazon region, area covered by Floresta+, the prices of conserved forest lands, in 2005, in the Amazonas state, oscillated between R$39/ha and R$102/ha, while areas with pastures were worth up to 9 times more. In Mato Grosso, with areas that are much more valued, those with conserved forests were sold at R$1,441/ha, and those with pastures with values 2.5 times higher. Indicating that land trade assigns a negative value to areas with excess native vegetation (Wunder et al., 2008).

According to the study commissioned by the Ministry of the Environment, in the PES scenario for the period 2007 to 2016, the benefits – in addition to the compensation of opportunity costs – for local residents vary between 0 and R$ 670/ha (low carbon dioxide prices) and 0 and R$ 1470/ha (higher prices). It is observed that the areas especially competitive for PES would be located, mostly, in the center, north and northeast of Amazonas, states that have the lowest adherence to CAR. Other competitive areas are in the center- east of Pará and on the border between Acre and Amazonas. Uncompetitive areas are in Mato Grosso, Rondônia and eastern Pará, areas with high deforestation rates and with a higher incidence of CAR records (Figure 5-27).

[68] https://www.ibge.gov.br/explica/inflacao.php

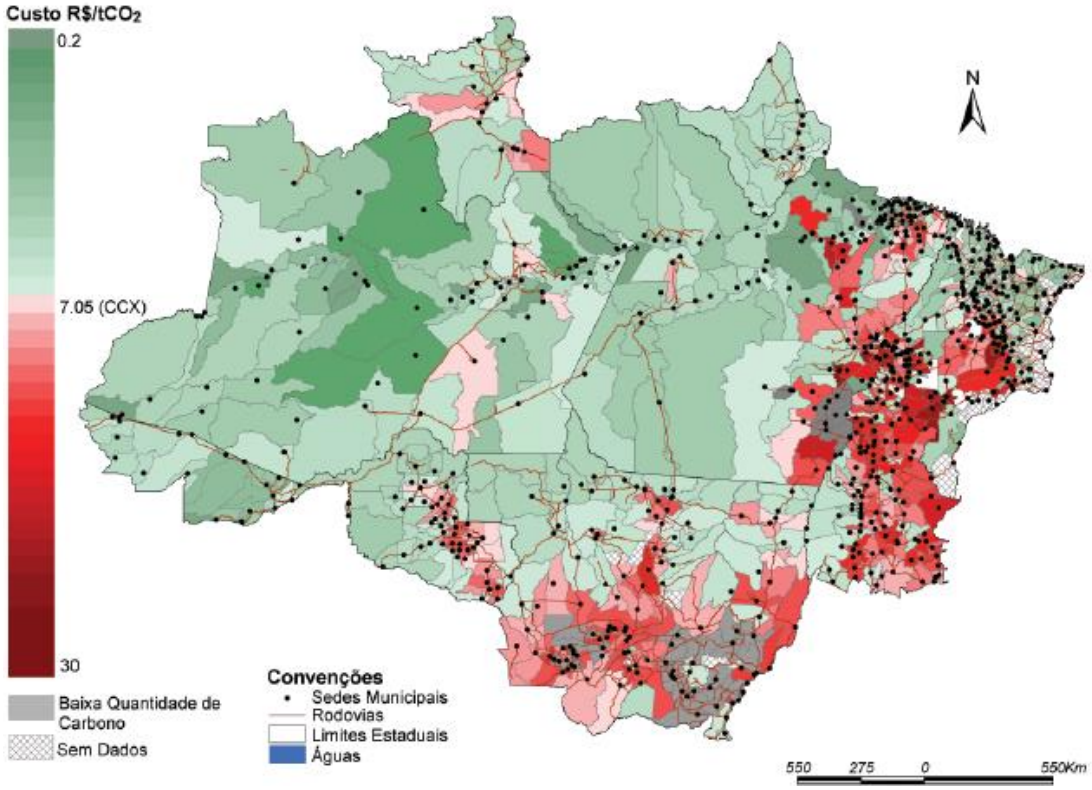


Figure 5-27 Average opportunity cost of avoided deforestation in municipalities in the Legal Amazon (Wunder et al.,2008).

These values estimated in 2008 are compatible with those published in a study published the following year (Nepstad et al., 2009). In the results of this second study, the state of Amazonas would also have the largest areas with low opportunity cost (Figure 5-28). As in the previous study, the areas of Mato Grosso correspond to high opportunity costs due to their low carbon content in soils with high aptitude for agriculture. Rondônia, Acre and Amapá would present intermediate values. Maranhão and Tocantins are home to the smallest areas of remaining forests.

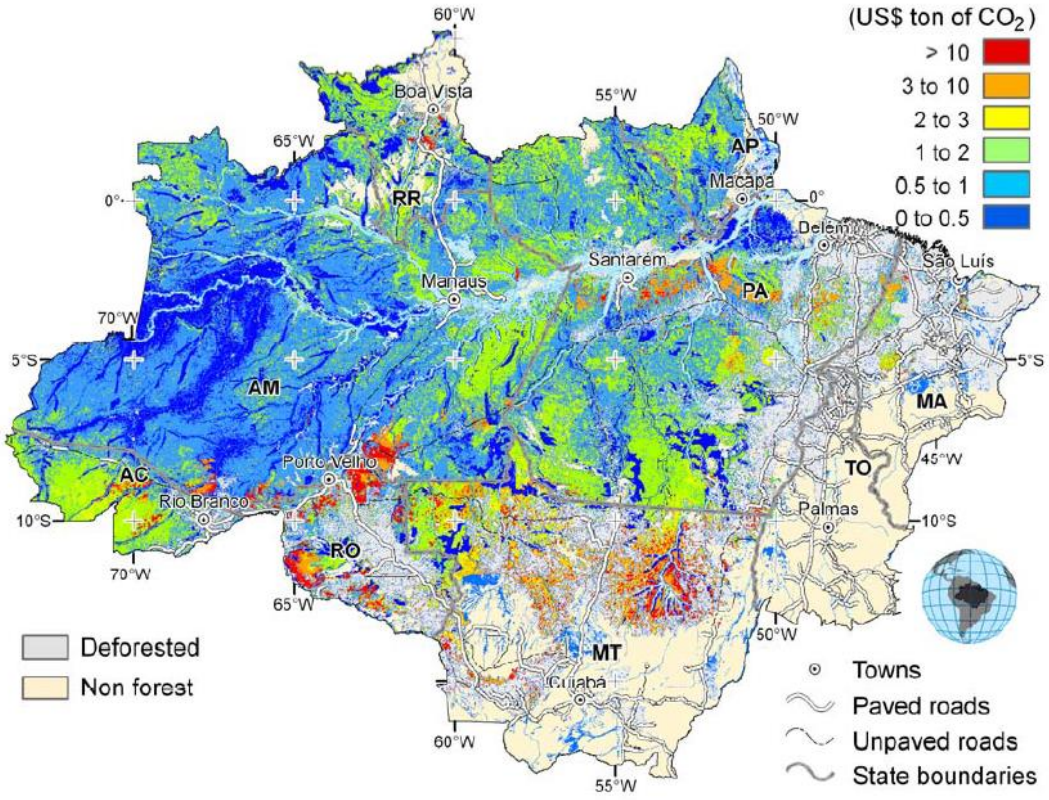


Figure 5-28 Map of opportunity costs for the forests of the Brazilian Amazon (CO2eq.). Values indicate lost profits from soybeans or livestock expressed as the net present value of the most profitable activity divided by the difference in carbon stock of the forest and the soybean crop or pasture for cattle. Opportunity costs are reduced by the potential VPLof sustainable logging. Source: Nepstad *et al.*, 2009.

5.4.4 Regional and National Experiences with Payments and Public Incentives for Environmental Services

In order to identify the lessons learned and concrete options for the operationalization of the Floresta+ Project and its monitoring framework, it is appropriate to analyze the regional and national experiences that have implemented public payments and incentives for environmental services in the Amazon region or other regions and in the national scale. However, so that the lessons learned can be fully utilized, it is first necessary to identify which experiences fit into what could be considered a PES scheme and others that can be evaluated as merely income transfer programs.

It is considered that the difference between income transfer programs and payment for the provision of an environmental service is because:

1) there is a selection of service provision proposals through the publication of a notice, which must contain the rules for the evaluation of environmental services and the definition of the amounts to be paid;

2) a contractual relationship is established between proponents and sponsors, with the definition of obligations and goals through which the project will become deserving of the incentive;

3) payment is made for the services rendered, always in proportion to the benefits provided (Advocacia Geral da União - AGU, 200[69]). The presence of conditions does not detract from the assistance nature of a program since they are aimed at meeting the needs of these same people.

Based on the protector-receiver principle (Legal principle of Brazilian environmental law, provided for in federal law 12,305/2010) (Gutierrez et al., 2017), the provider may be rewarded for the environmental service itself, but not for its ecosystem services arising from them. This reward can be given through different economic instruments, such as incentives or payments, in compensation systems for environmental services, with the beneficiaries and the sponsors/payers defined by law or contract. These compensation systems, however, are not to be confused with payment schemes for environmental services - PES, as they are the genus of which PES is just a species, which only takes shape when there is additionality (Engel et al., 2008) and willingness to provide environmental services. Additionality refers to the adoption of practices that result in environmental gains greater than those of an established baseline, practices that would not be adopted if (Fasiaben et al., 2009) there was no compensation (García-Amado et al. 2011).

Programs considered as payment schemes for environmental services, if they do not meet one of these conditioning characteristics, may correspond to other types of environmental compensation, other than payment, or else compensate/repay activities that cannot be considered as environmental services. In the contractual relationship of PES, provider-receiver agents and payer-beneficiaries must be clearly identifiable, as well as what is being paid and how payments are made (Pagiola et al. 2004). Pagiola et al. (2013) indicated that, in 2006, several PES pilot experiments began at a local scale in Brazil. They analyzed 14 experiences of PES in Brazil, both at local (municipal) and state and national scales, including the Bolsa Floresta Program of the State of Amazonas. Although the term "Payment for Environmental Service - PES" was not widely known at the time, some consider the Social and Environmental Development Program for Rural Family Production - Proambiente, by the Ministry of the Environment, started in 2003, as the first Brazilian initiative for PES.

The most complete and significant PES experience in terms of scope and volume of resources already implemented in the country is the Amazon Fund. The Amazon Fund was created by the Federal Government in 2008, through Decree No. 6,527, of August 1, 2008, with the purpose of allocating donations received in kind to "[...] making non-refundable investments in actions to prevent, monitor and combat deforestation and to promote the conservation and sustainable use of the Amazon biome [...]" (art. 1°). In November 2017, the Amazon Fund supported a total of 89 projects from different executors, namely, the third sector, the Union, States, Municipalities, Universities and international project partners. To this end, the Fund disbursed approximately R$793 million reais (FUNDO AMAZÔNIA, 2018). As an experience of the Federal Government itself, as well as the Water Producer Program[70] of the National Water Agency – ANA, certainly the lessons learned from these initiatives are already being incorporated into the project by the MMA itself, with no further considerations being applicable here.

More recently, Brazilian jurisdictional programs have been considered typical PES, as is the case of the Bolsa Floresta of the State of Amazonas and the Bolsa Verde Program of the State of Minas Gerais (SIMÕES; ANDRADE, 2013). The first state to enact a PES law in the country was Amazonas in 2007, followed by Acre and Espírito Santo in 2008. The states that sanctioned laws until 2016, but that did not have associated programs or projects were: Bahia, Paraíba and Paraná. In the case of Espírito Santo and Santa Catarina, the law was undergoing changes to adapt it to the needs of ongoing projects.

The accumulated amount spent with the state programs, from 2008 to 2015, was approximately R$ 54.4 million, and the preserved area was 76,300 hectares. The minimum amount paid per hectare per year is R$ 10.00 in Rio de Janeiro (PES for conservation, equivalent to Modality 1 of Floresta +) and the maximum amount is R$ 2,866.24 in Espírito Santo (PES Restauration, equivalent to Modality 2 of Floresta+). There are programs that

[69] AGU opinion issued on the Water Producer Program of the National Water Agency – ANA. Since 2006, the WaterProducer Program has supported PES schemes in different regions of the country

[70] https://www.ana.gov.br/programas-e-projetos/programa-produtor-de-agua

pay per producer, with values between R$500.00 and R$600.00 per year, regardless of the number of hectares. This type of payment is found mainly in existing initiatives in Acre and Amazonas (De Castro et al., 2018).

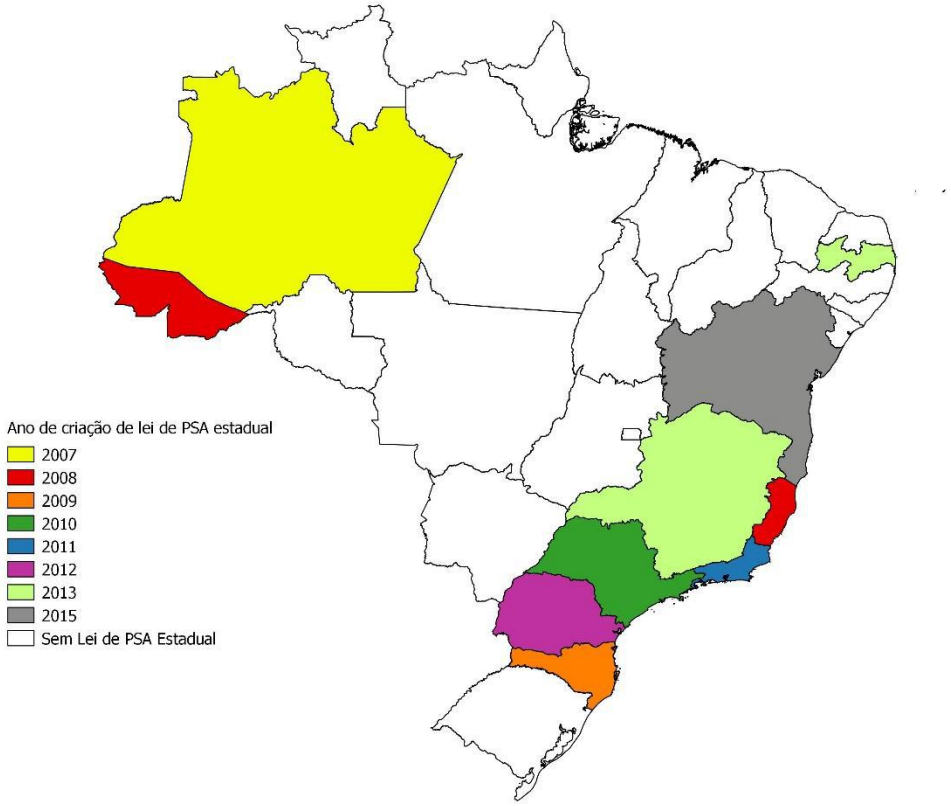


Figure 5-29 State Laws on Payments for Environmental Services already enacted in Brazil by 2015. (De Castro et al.; 2018).

Bolsa Floresta do Amazonas Program

The State Policy on Climate Change, Environmental Conservation and Sustainable Development of Amazonas created different programs that aim to reduce emissions originating from deforestation and net emissions of greenhouse gases, as well as establishing incentive instruments to make their implementation feasible. In total, seven programs were created in the state of Amazonas, as provided for in art. 5 of State Law No. 3,135, of June 5, 2007: (I) State Program for Education on Climate Change; (II) Bolsa Floresta Program; (III) State Environmental Monitoring Program; (IV) State Environmental Protection Program; (V) State Program for the Exchange of Clean and Environmentally Responsible Technologies; (VI) State Training Program for Public Bodies and Private Institutions; and (VII) State Program for Incentives for the Use of Clean Alternative Energy and for Reducing Greenhouse Gas Emissions. Although all the programs aim to increase the State's environmental conservation and sustainable development actions, the Bolsa Floresta Program gained prominence because it specifically deals with payment for environmental services. Art. 5, II of the policy provides as follows:

> Art. 5 For the implementation of the State Policy referred to in this law, the following Programs are created:
>
> [...] II - Bolsa Floresta Program, with the objective of instituting payment for environmental services and products to traditional communities for the sustainable use of natural resources, conservation, environmental protection and incentive to voluntary policies to reduce deforestation; Thus, the objective of the program is to compensate, through investments in income generation and social development, traditional populations for their willingness to conserve forests (providing environmental services), to guarantee the provision of ecosystem services for the area.

In compliance with legal purposes, the Amazonas Sustainable Foundation (FAS) was created on December 20, 2007, as a private, non-profit, non-governmental foundation, headquartered in Manaus.

The Bolsa Floresta Program (PBF), run by the Amazonas Sustainable Foundation (FAS) since 2007, contributes to enabling the development of an economy based on products derived from sustainable forest management, through payment for environmental services and products to traditional communities for sustainable management of natural resources, conservation, environmental protection and encouragement of voluntary policies to reduce deforestation.

The program has four benefit components:

- Bolsa Floresta Income – Investment in productive inclusion to fight poverty and preserve the environment.
- Bolsa Floresta Social – improving the quality of life through investments in the community, aimed at reversing the situation of social vulnerability that compromises the survival of citizens and families.
- Bolsa Floresta Association – Investments aimed at strengthening community associations, about claims, participation and social control.
- Bolsa Floresta Family – encouraging the involvement of families in environmental conservation, aimed at ensuring survival (of income and autonomy) (FAS, 2015, p. 01).

Initially, FAS promotes a workshop to introduce the Bolsa Floresta and training on climate change in the chosen UCs. Then, the mothers of the families that will participate in the program sign the term of commitment and start to receive the monthly amount of R$50.00 (or R$600.00 per family/year). Thus, the program begins with the implementation of the Bolsa Floresta Family – BFF component, which is the only PBF modality in which each family receives the money directly.

Then, participatory workshops are held to define how the money available through the other modalities of the program will be invested in the community. Through the Bolsa Floresta Income - BFR component, FAS makes a direct investment of R$395.80 per family/year in the community in projects that support sustainable agroforestry production (fish, vegetable oils, fruits, managed wood, honey, etc.) and promotion of productive arrangements. BFR resources are used for infrastructure, equipment, services and training, as defined by each community. In return, the beneficiaries undertake to implement and take care of the projects.

Through the Bolsa Floresta Social – BFS component, the foundation provides R$350.00 per family/year for communities to invest in improving education, health, communication and transport. The investment can be made directly by the program or in partnership with local governments. Finally, the Bolsa Floresta Association

– BFA component transfers to the Residents' Associations of each UC the amount of R$67.20 per family/year, with the objective of strengthening the organization, promoting and enabling the participation of communities, in the implementation of these actions within the UCs served by the program.

The “Bolsa Floresta+ Program” supports 16 sustainable use UCs in the state of Amazonas for:

1. the continuity of actions within the scope of the Bolsa Floresta Income component, through consultancy for sustainable management and direct investments (equipment, works and installations) to increase the scale of production of small community enterprises. Actions that contribute to a better insertion in the market of products and services of 16 sustainable productive arrangements in the region are also supported, such as: elaboration of business plans, development of products and certifications, in addition to technical assistance;

2. the strengthening of representative associations of the UCs within the scope of the Bolsa Floresta Association, through financial support both for structuring actions (repairs at headquarters, purchase of equipment) and for the organization of assemblies, meetings and other expenses necessary for the decisions and investment management are carried out collectively;

3. the management of knowledge accumulated by FAS and communities in the implementation of solutions for the sustainable development of the Amazon. These actions aim to systematize and disseminate good practices and lessons learned to the various actors interested in the subject, so that it is possible to make such knowledge public and replicate the actions in other locations. Technical-

scientific publications on priority sustainable productive arrangements, assessment of the social and economic impacts of investments in income generation and seminars on the subject will be supported, enabling the appropriation of this knowledge by academia, government and the third sector, also being considered knowledge dissemination for the residents of the region covered by the project, through publicity actions, radio spots, workshops, community forums and discussion circles; and

4. the realization of a public call, with the objective of supporting small and medium sustainable productive projects of community base, in the region surrounding the UCs, aiming to reduce the pressure of deforestation around the protected areas.

The total value of this project is R$ 31,518,490.00.

The PBF can be considered as a payment scheme in which both the payer and the recipient are private agents, since the FAS is a foundation under private law that executes a public policy. On the part of the provider-receivers, in this case, the residents of the UCs, the voluntariness of the PBF could not be characterized as adherence to the rules of the UC Management Plans[71], since such plans, once approved by the managing body, have the force of law, obliging residents to comply with the rules for access and use of natural resources defined therein.

To participate in the PBF, the provider-receivers sign a commitment term, assuming as obligations: (I) to comply with the rules of the use plan or reserve management plan; (II) promote zero deforestation in primary forest areas[72]; (III) carry out proper fire management, (IV) in addition to being associated and complying with the reserve residents' association, participating in its activities, and (V) keeping the children in the school closest to their residence. The term is preferably signed by the matriarch of the family, who makes a commitment on behalf of the entire family, which inscribes the PBF in the context of public policies aimed at seeking greater gender equity. In the term, there is also a topic corresponding to a housing declaration signed by the community leader.

In order to verify whether the PBF meets the additionality requirement, it is first necessary to identify which environmental service would be provided by the residents of the UCs. In the case of the PBF, the service cannot be individualized and verified directly as in the case of programs such as 'Grain-for-Green' (Gauvin et al. 2009; Lei Deng & Shangguan, 2014). Thus, it was taken as a reference the fact that each beneficiary family renounced the right to open new parcels of cultivation (roças) in areas of primary forest. According to the classification proposed by Pereira and Camargo (2014), the PBF can be classified as an environmental service of "reduction of negative externalities through mitigation". A mitigation service is related to changes in ecosystem or resource management practices that mean a reduction in the negative impact on the integrity of associated ecosystems or that reduce the demand for ecosystem services, for example, in the case of technology adoption "cleaner" production.

For program managers, a demonstration of the additionality of the BFP would be comparative data on deforestation and hotspots between the served and unserved areas. While in the UCs participating in the program there was a 35% reduction in the deforestation rate between 2014 and 2015, in the UCs not served, in the state and in the region there were increases of 13.9%, 42.4% and 23.8%, respectively (FAS, 2017). However, this monitoring is done with data supplied by PRODES/INPE whose methodology allows detecting deforestation polygons by clear cut (complete removal of forest cover) whose area is greater than 6.25 ha (INPE 2013), which is not suitable to assess the pattern of deforestation caused by traditional family farming that produces deforestation with areas between 0.5 and 1.0 ha (Dutrieux et al., 2016). The same trend will have

[71] Management Plan is the technical and managerial document, based on the objectives of the Conservation Unit, which establishes the zoning, the rules that regulate the use of the area and the management of natural resources, including the implementation of thephysical structure necessary for the management of the Unit (AMAZONAS, 2007)

[72] According to the PBF rules revised in November 2017: "Maintain the "roça" areas with a size no greater than that of the year in which the Bolsa Floresta Program was instituted, cultivating only in open scrub or resting areas, not advancing into primary forest, that is, maintaining "zero net deforestation

been observed in relation to hot spots, which reduced from 145 to 125 per million hectares in the participating UCs in the period 2015 to 2016, while in the other units, although they also had a reduction, they still had almost twice the number of hot spots comparatively (FAS, 2017).

Although there are elements of voluntariness and potential additionality, the PBF is not a typical system of payment or even compensation for environmental services, but rather a resource transfer program, of a welfare nature, with some environmental conditions. Although the PBF has four modalities and in three of them the community defines how the resources will be applied, there is no variation in the amounts transferred by family, which is fixed in all modalities, regardless of their peculiarities. What the program considers is, in fact, the needs of the families, not the effective provision of an environmental service. In other words, the transfer of resources is not based on results, on the valuation of the service provided, but is only linked to the needs of the residents of the areas. The experience of the Amazonian PBF, especially its Income, Social and Association components, is the one that best approximates the design of modality 3 of the Floresta+ Project, and the lessons learned in this program implemented in Amazonas by FAS can help in the operationalization of the UNDP project.

Bolsa Verde Program from Minas Gerais

Bolsa Verde, which is a program of the state of Minas Gerais (Law number 17,727 of August 13, 2008, regulated by State Decree number 45,113 of June 5, 2009), and which aims at remunerating the owners and squatters who keep preserved areas with native vegetation. This program aimed to compensate agents for the protection of areas providing ecosystem services, water regulation and biodiversity shelter, seeking to promote, at the same time, the development of the rural environment (SIMÕES; ANDRADE, 2013).

Similar to what is defined for Modalities 1 and 2 of Floresta+, the Minas Gerais program provided that four categories of candidates will have priority in the choice of participants: i) family farmers; and ii) rural producers whose property or possession has an area of up to four fiscal modules. The other requirements differ from Floresta+, namely, iii) producers whose properties are located in Conservation Units of management categories subject to expropriation and pending land regularization; and iv) potential owners of urban areas that preserve areas that produce the services targeted by the program. The program differentiated three payment amounts: a greater volume of resources for owners and squatters who conserve or preserve areas above the limit established by law in terms of regularization of the Legal Reserve and protection of Permanent Preservation Areas, equivalent to modality 1 of the Floresta +. An intermediate value for properties that maintain at least the limits determined by the LPVN. Finally, the lowest value of properties and possessions that require environmental regularization, which would correspond in part to modality 2 of Floresta+.

Until 2011, payments in the amount of R$200.00/hectare/year had been made to 980 establishments elected by the Executive Secretariat of Bolsa Verde. Until the month of November of that year, approximately R$ 6.5 million had been committed in payments for the protection of approximately 32,300 hectares of preserved native vegetation (Simões; Andrade, 2013).

5.4.5 Agrarian Conflicts in the Amazon

The Amazon stands out as one of the greatest holders of socio-biodiversity on the planet, with diverse natural resources and forest wealth that makes it possible to directly combat climate change, which is mostly caused by anthropic actions. From this perspective, keeping the forest standing has become a great challenge especially for the residents who live in these territories, who live daily with fierce assaults aimed at illegally appropriating the forests.

Furthermore, agrarian conflicts in Brazil have intensified each year, according to the Pastoral Land Commission

- CPT, the occurrences have increased significantly in the last 10 years, in 2011 there were a total of 818 occurrences due to land conflicts in the year 2020 the number of occurrences almost doubled, reaching 1576 occurrences. These numbers point to a reality that intensifies every year, especially in the Amazon. Table 5-37 presents a comparison of land conflicts in Brazil from 2011 to 2020.

In the general context, conflicts over land in Brazil grow every year, and the frequency with which they expand, both by occurrences and with people involved, presents a worrying panorama regarding the safety of the inhabitants of the territories and the sustainability of the biodiversity of the Forest.

Table 5-37 Comparison of conflicts over land in Brazil (2011 – 2020). Source: Pastoral Land Commission – CPT, 2020.

	Year									
Conflicts	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Occurrences	818	828	802	820	828	1,112	1,033	1,000	1,260	1,576
Occupations/Retakes	211	255	245	223	234	224	193	157	46	29
Camps	32	15	15	22	30	25	13	20	5	3
Murders	30	34	30	37	49	61	70	27	27	14
People involved	491,660	471,160	461,065	622,495	642,005	736,590	639,715	664,470	580,228	687,872
Hectares	14,410,626	13,181,570	6,228,667	8,134,241	21,387,160	23,697,019	37,019,114	39,425,494	53,313,244	77,442,957

Regarding agrarian conflicts in the Amazon, it has been historically perpetuated since the time of colonization, and each year it takes different forms and applications, with the purpose of appropriating natural resources in a more fierce and invasive way.

The data that will be presented had as a source of information the Atlas of Conflicts in the Amazon, organized by the Pastoral Land Commission - CPT, specifically of the regionals established in each State that make up the Legal Amazon, and the database of the Brazilian Institute of Geography and Statistics – IBGE.

It is interesting to note that the Amazon is significantly extensive from a territorial, cultural, social and population point of view. Embedded in this perspective is a diversity of realities, culture and customs inherited through ancestry and others inserted in harsh ways, in many conflicting situations. In this way, it is important to outline the peculiar conflicts of each state that comprises the Legal Amazon.

Acre

Acre is a Brazilian state bordering Peru and Bolivia; historically it is a state that in its genesis the conflict was always present. The 1867 Treaty of La Paz de Ayacucho recognized that Acre's lands belonged to Bolivia. A few years later, there was an occupation by Brazilian rubber tappers supported by the government of Amazonas, which later resulted in the Acre Revolution, which began on August 6, 1899. With the end of the Revolution, Brazil and Peru signed the Treaty of Petrópolis, later delimiting the border areas (CPT, 2017).

The state was the scene of a lot of struggle against deforestation and land appropriation by squatters and speculators in the 70s. Currently, the dispute for land in Acre is given by squatters, rubber tappers and riverside dwellers, who have resisted in their possessions for centuries, besides unemployed people, farm workers and migrants from other states. Currently, the State is experiencing an unbridled land dispute throughout the territory and numerous repossessions.

On the limits of the Cunha Gomes Line, in the municipality of Porto Acre, between Acre and Amazonas, there is one of the hotbeds of conflict. There, several squatters have died because of the struggle for land ownership. In Seringal Macapá (AM), families have been in tension since 2007. In Santo Antônio, on Gleba Ituxi, the border between AM, AC and RO, there are agrarian conflicts that have dragged on for years. Over time, the rubber plantations strategically change their name. The strategy serves to change the focus, showing that there are no conflicts of any kind there (CPT, 2017).

It should be noted that of the 22 municipalities that make up Acre, 11 municipalities have registered conflicts, that is, 50% of the municipalities in the state of Acre are involved in agrarian conflicts. This demonstrates the peculiarity of the Amazon as a whole, in its sociocultural, territorial and population aspects, considering that each State will present an individual scenario, which may resemble or express an unusual disparity.

It is important to highlight how these conflicts are geographically located. Figure 5-30 shows, in a specific way, the focus of conflicts and the quantities. There are 57 conflicts, which encompass 11 municipalities in the state, directly involving 4,026 families. This spatial vision makes it possible to broaden the comprehension of the problem within the Amazon context, and the relevance of the debate within this context can make it possible to formulate public policies aimed at mitigating such impacts.

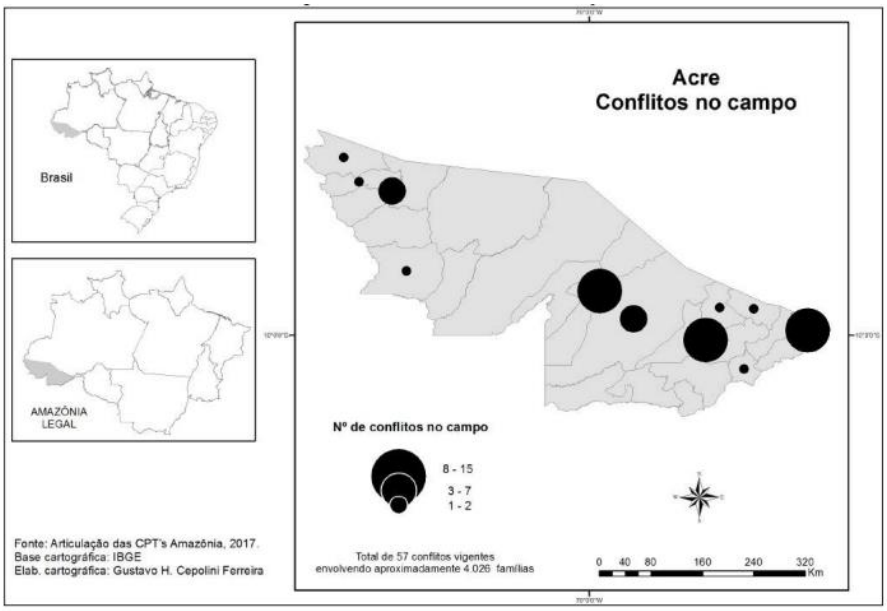


Figure 5-30 Map of field conflicts in the state of Acre.

Amapá

Amapá is known as the last frontier of agribusiness expansion in Brazil. The privileged location, added to the climate and soil favorable to the cultivation of grains in the Cerrado areas, are characteristics that favored the recent advance of the agricultural frontier in the region. However, the geographic stimulus, by itself, was not enough (CPT, 2017). Decree 8,713/2016, which regulated Law 10,304/2001 and concerns the transfer of ownership of public lands from the Union to the State, emerged as an incentive measure for the massive development of agribusiness in Amapá.

According to the CPT (2017), numerous strategies have been adopted by entrepreneurs to expand their businesses, including advancing to environmental conservation areas, such as the State Forest of Amapá (Flota) Tools such as the Land Management System (SIGEF), Rural Environmental Registry (CAR) and the Legal Land Program have been used by large landowners with the aim of illegally squatting and taking possession of public land and small squatters.

With the advance of agribusiness in the state, conflicts tend to increase, according to data collected by the Atlas of Conflicts in the Amazon organized by the CPT, from the 16 municipalities that make up the state of Amapá, all of which have a record of conflicts (Table 5-38), that is, in 100% of the municipalities in the state of Amapá there are conflicts in the field.

Table 5-38 Number of conflicts in the field and families involved. Source: CPT's Amazon Articulation, 2017. Org. GHCF

	Municipalities	No. of conflicts	No. of families
1	Tartarugalzinho	17	223
2	Macapá	15	1,118
3	Ferreira Goma	8	290
4	Amapá	6	87
5	Mazagão	6	143

6	Itaubal	5	94
7	Serra do Navio	4	75
8	Calçoene	4	83
9	Porto Grande	4	62
10	Cutias	3	69
11	Santana	3	49
12	Pracuúba	2	30
13	Pedra Branca do Amapari	1	23
14	Laranjal do Jari	1	SI
15	Oiapoque	1	80
16	Vitória dólar'	1	57
Total		81	2,483

Amazonas

The scenario of conflicts in communities in the state of Amazonas has increased every day. Some municipalities stand out in this scenario. In the municipality of Parintins, buffalo breeding has affected farmers in the region for over 15 years, ending the planting of local farmers. In Gleba Vila Amazônia, the National Institute for Colonization and Agrarian Reform (INCRA), carried out a settlement that benefited 2,253 families with over 500 added to the occupation. The failure of the agency to provide assistance to the settlers have caused several problems. Abandonment, land sale and purchase (agrarian lots), environmental crimes, illegal extraction and sale of wood, illegal occupations and intensification of conflicts are constant in the region (CPT, 2017).

According to the CPT (2017), the exploitation by large loggers marks the conflicts in Maués, located 85 km from Itacoatiara. The companies occupy land and make it difficult for riverine dwellers and Sateré-Mawé indigenous people to live together. In the municipality of Presidente Figueiredo there is an atypical situation, a lumber company buys area within a reserve that covers several communities, but the title has expired, and the situation is in court.

In the municipality of Presidente Figueiredo, 906 families are affected. Farmers are unable to receive loans and invest in their land, because of the situation and are waiting anxiously for the court's decision. The communities of Terra Santa, Abonari, Jardin Floresta I and II, Micad, Rumo Certo, Novo Rumo, Nova União, Nova Jerusalem, Castanhal, Canastra in Presidente Figueiredo (Schwade, 2012).

In Amazonas, currently 13 municipalities have conflicts in the field of the total 62 existing (IBGE, 2017), that is, 21% of municipalities in the state of Amazonas are involved. Geographically, the largest number of conflicts is in the municipality of Boca do Acre (Figure 5-31) containing 24 cases of conflicts, followed by the municipality of Presidente Figueiredo with 14 cases of conflicts.

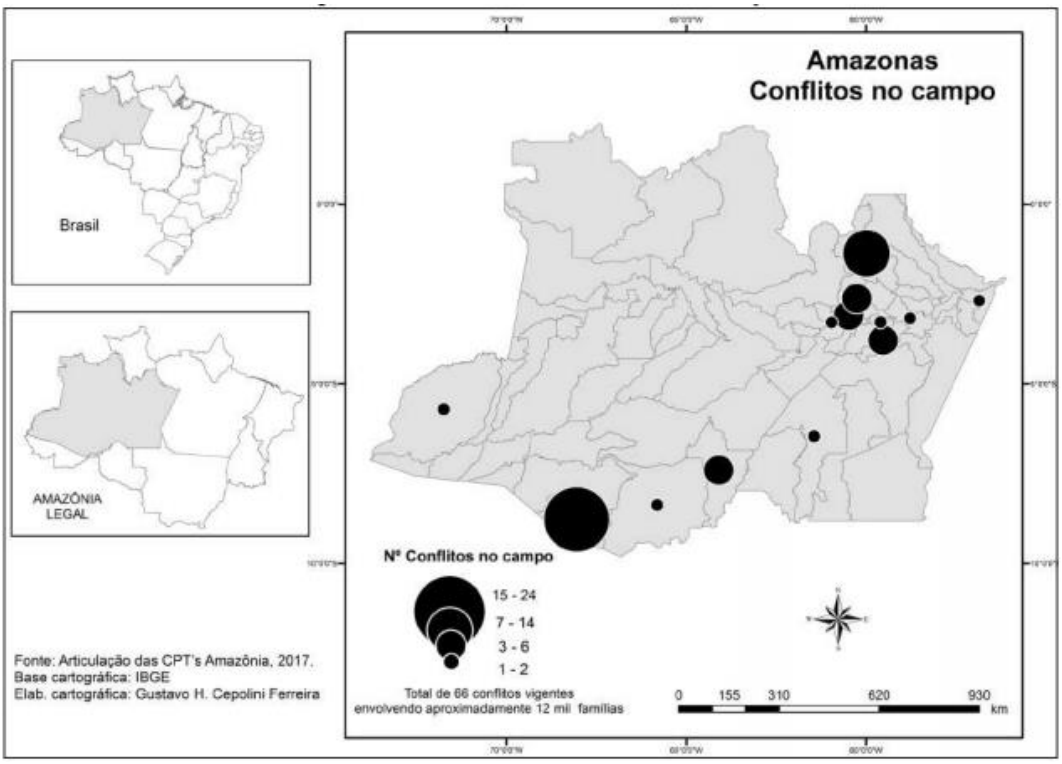


Figure 5-31 Map of field conflicts in the state of Amazonas

Maranhão

The expansion of the frontiers of the agricultural, water and mining business in the countryside of Maranhão has negatively impacted the way of life of traditional communities and indigenous peoples in their territories of life. In this state, at least two factors gain prominence, the first being known as squatters (private use of vacant land) which, from Law 2,979, of July 17, 1969, makes it "formally" regulated and the second is the intensification of conflicts between land grabbers and those who will be called squatters. (CPT, 2017).

In this context, the indigenous struggle in defense of the territory becomes intense, as the legislation makes room for the occupation of indigenous land, which is called land subdivision, where those who took possession of the land limited their land through fences and barriers. To continue the struggle and resistance, several communities joined together in joint efforts preventing the installation of fences by land grabbers.

In 2013, the indigenous people intensified their struggle for the Brazilian State to proceed with the demarcation and ratification of their territory under the terms of current legislation. Therefore, conflicts have intensified violently, death threats are constant with firearms fired against the indigenous people. Farmers are still filing lawsuits aimed at evicting indigenous people from areas that have already been repossessed. Currently, 9 lawsuits are being processed in federal court.

In Figure 5-32, conflicts over land can be seen in a large part of the State; currently 66 municipalities have field conflicts, out of a total of 217 existing municipalities in Maranhão (IBGE, 2021), that is, 30% of municipalities in the state of Maranhão is involved in field conflicts. Generating a total of 197 conflicts across the state, involving approximately 16,252 families.

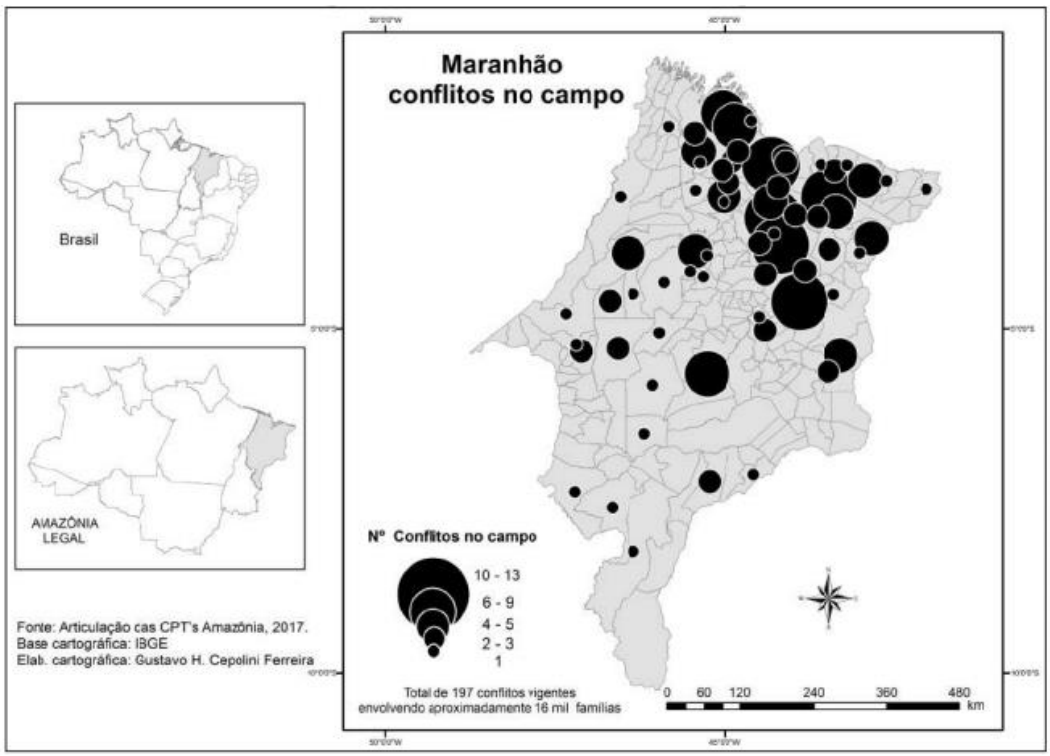


Figure 5-32 Map of field conflicts in the state of Maranhão.

Mato Grosso

The conflict in the Amazon region where the state of Mato Grosso (MT) is located, the Legal Amazon, concentrates 62% of the occurrences of conflicts in Brazil. In 2016, 74,692 families were involved. These data reflect a strong offensive on space (CPT, 2017). Recently, the hydro-energy model has been causing conflicts and evictions due to flooding in the construction of dams.

In Mato Grosso, the dispute between land grabber farmers marks the acts of violence that take place in the countryside and in the city. Figure 5-33 presents geographically the families in conflicts in the field; currently 97 municipalities have field conflicts out of a total of 141 existing municipalities in Mato Grosso (IBGE, 2021), that is, 69% of municipalities in the state of Mato Grosso are involved in field conflicts.

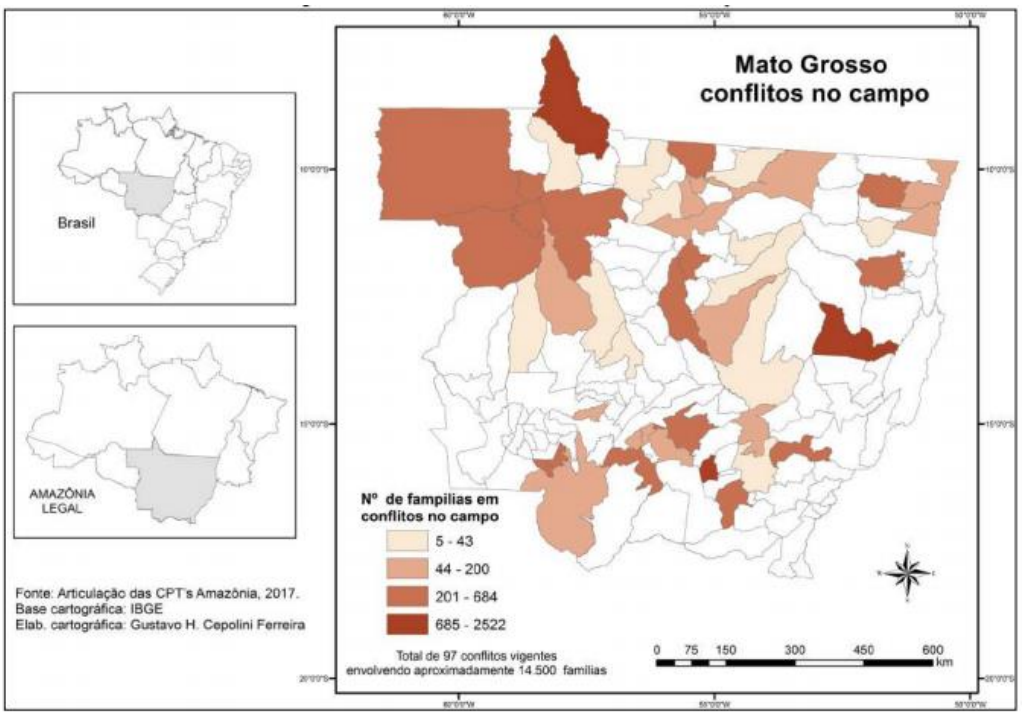


Figure 5-33 Map of families in rural conflict in the state of Mato Grosso.

Pará

In the state of Pará, agribusiness and mining companies demand new legal mechanisms and more works that allow greater freedom for land concentration and exploitation of mineral wealth. In southeastern Pará, approximately 80% of the areas surveyed for mining are within lands occupied by settlers, quilombolas, indigenous people and in areas of environmental preservation.

In Pará, conflicts are raised and mostly violent. Violence takes place in different ways, intimidation, threats, attacks, murders and massacres, the numbers of this violence are repeated every year. Since then, many companies continue their activities causing various types of conflicts in dozens of communities. Currently 42 municipalities have conflicts in the field (Figure 5-34), out of a total of 144 municipalities in Pará (IBGE, 2021), that is, 29% of municipalities in the state of Pará are involved in conflicts in the field (CPT,2017).

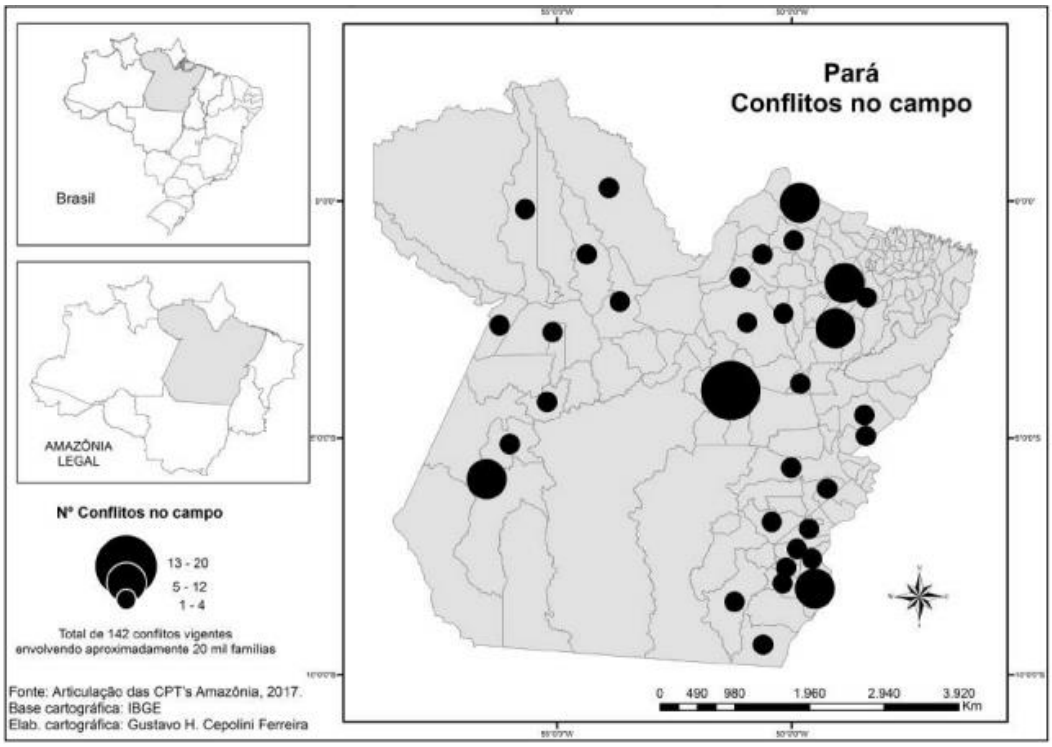


Figure 5-34 Map of field conflicts in the state of Pará.

Rondônia

In Rondônia, conflicts in the field involve indigenous and traditional communities (rubber tappers, quilombolas, riverside dwellers), as well as untitled squatters and social movements fighting for agrarian reform. The riverside dwellers of the Madeira River are still facing the socio-environmental consequences of the construction of the two large plants in Jirau and Santo Antônio. They also complain about the progress of projects for two new large hydroelectric plants in Cachoeira do Ribeirão (Nova Mamoré) and Tabajara (Machadinho). Among the environmental and extractivist reserves in Rondônia, the conflict in the Jaci Paraná State Extractivist Reserve stands out, which is completely taken over by invaders (CPT, 2017).

However, most rural conflicts affect groups of landless squatters and peasants, who challenge the advance of agribusiness. Most are independent associations and groups. Rondônia had the worst records of violence and deaths in the field; there were 56 murders of peasants in field conflicts between 2015 and July 2017. Currently 35 municipalities have field conflicts out of a total of 52 municipalities in Rondônia (IBGE, 2021), that is, 67% of municipalities in the state of Pará are involved in conflicts in the field.

Roraima

In the state of Roraima, conflicts are intense, demonstrated by various situations of violence against rural workers, among which are death threats, impediments to the right to come and go, physical and moral violence and disrespect for the rights of rural workers, situations that are part of the reality of the State. Some conflicts receive support from social movements that seek to articulate so that everyone's rights are guaranteed. According to the records of the CPT's Amazon Articulation, currently 9 municipalities have conflicts in the countryside, that is, in 60% of the municipalities in the state of Roraima there are conflicts in the field.

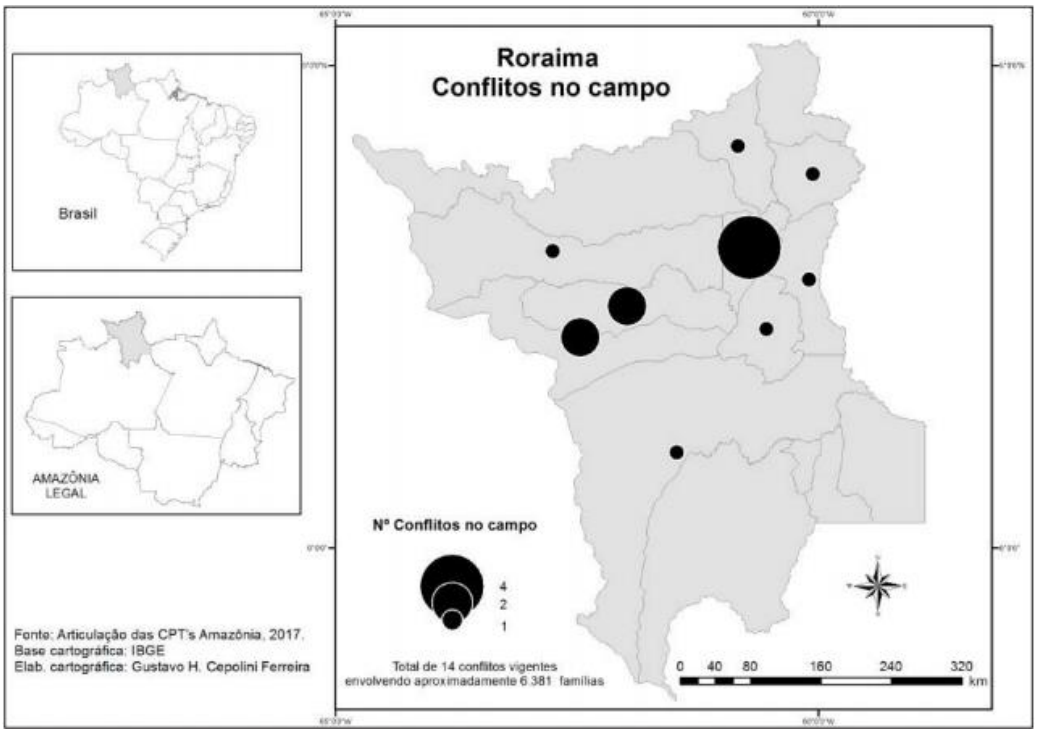


Figure 5-35 Map of field conflicts in the state of Roraima

Tocantins

Every year, the number grows of communities exposed to situations of conflicts caused by the advance of agribusiness with soy, eucalyptus and cattle raising. Agrarian conflicts in the state of Tocantins increased significantly in 2016, reaching 135, surpassing the systematized data in 2015 when 34 cases were registered. Occurrences against land tenure with expulsion, evictions, destruction and burning of houses are also worrying. There are several vulnerable communities throughout the state territory. The 2016 data show 99 occurrences of conflicts over land, involving 5,453 families, numbers higher than the years 2013, 2014 and 2015, which add up to 79 occurrences (CPT, 2017).

Around 14 traditional communities of squatters are under threat from repossession lawsuits filed by “land grabbers”. What most contributes to the intensification of conflicts, in these specific cases, is the overlapping of titles in areas of the Union. These titles were issued irregularly by the Instituto de Terra do Goiás (IDAGO) even during the period when this region was part of the Goiás State and more recently by the Instituto de Terra do Tocantins (INERTINS), that is, public land improperly titled for alleged farmers.

Areas of agrarian conflict in Tocantins involve approximately 170 peasant groups, among them squatters, landless, settlers, riverside dwellers affected by dams, quilombolas and indigenous people. Another 34 areas are quilombola communities fighting for the repossession of their territories that were invaded by “farmers”. Currently, 52 municipalities have field conflicts out of a total of 139 municipalities in Maranhão (IBGE, 2021), that is, 37% of municipalities in the state of Tocantins are involved in field conflicts.

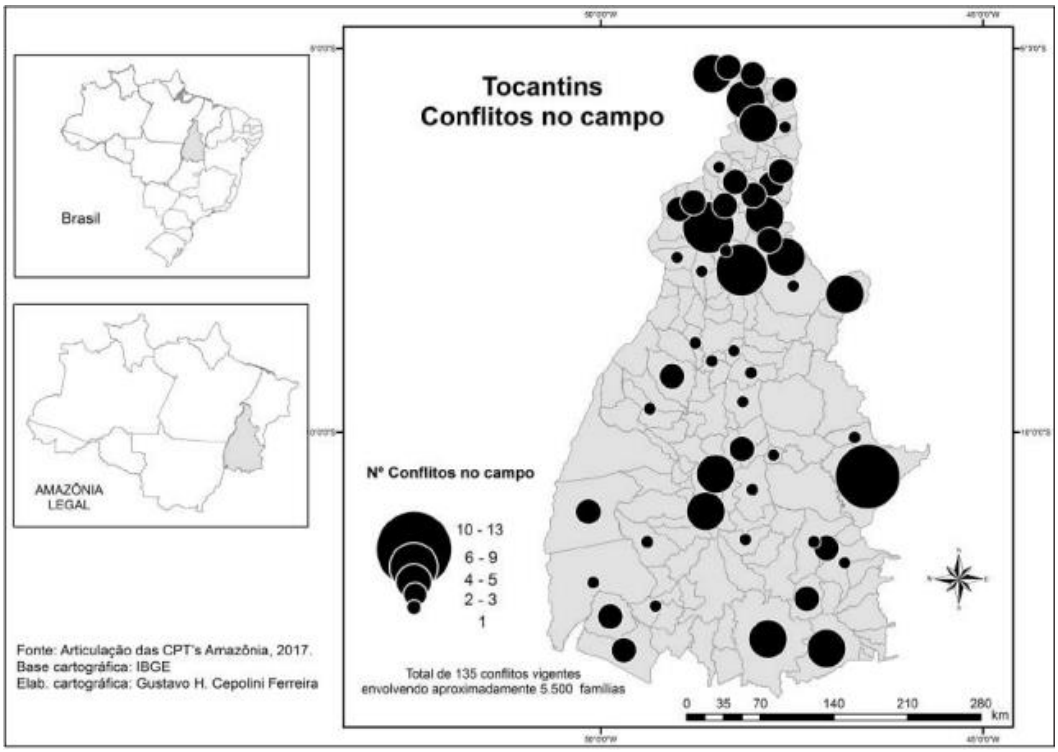


Figure 5-36 Map of field conflicts in the state of Tocantins.

5.4.6 Resource banking

One of the questions that must be answered is related to the way in which the resources from payments for environmental services of the Floresta+ Amazônia Pilot Project must reach the beneficiaries, and in Brazil the predominant form of transfer of government financial benefits is through bank accounts.

The main Government Banks present in the Amazon Region are Banco do Brasil (BB), Banco da Amazônia (BASA), Caixa Econômica Federal (CEF) and the Banco Nacional do Desenvolvimento (BNDES). However, Banco do Brasil and Caixa Econômica Federal are responsible for a large part of the transfer of benefits to a large public, such as Bolsa Família and Emergency Aid. Banco Bradesco is a private bank that also contributes with part of these transfers, mainly the Continuous Cash Benefit (BPC).

A large part of the public served by these government assistance programs are small farmers and Family Farmers, who need to have a relationship and basic knowledge of financial procedures to receive benefits. Similarly, for bank financing to develop actions that improve rural production or the property's infrastructure, farmers need to have knowledge of banking processes or a person to help them in the process. However, reality shows that between the total number of Family Farmers per state and the number of Family Farmers who were served with bank financing is expressively small.

All states in the Legal Amazon showed values below 20% of farmers who obtained some form of rural financing, with a predominance of bank resources. In the state of Rondônia, approximately 17% of Family Farmers obtained rural financing, the states of Tocantins and Mato Grosso present similar values. In the other states of the Legal Amazon, approximately 5% of Family Farmers obtained bank financing (Table 5-39).

Table 5-39 Family Farmers who obtained financing from banks, credit unions or governments in states in the LegalAmazon.

Federation Unit	Family farming				
	Total	Received financing	Funding source		
			banks	Credit unions	Governments
Rondônia	74,329	15,025	13,365	1,476	911
Acre	31,109	3,030	2,840	22	192
Amazonas	70,358	3,832	3,065	88	614
Roraima	13,103	960	878	9	71
Pará	239,737	14,510	12,699	320	1,253
Amapá	6,984	363	329	2	31
Tocantins	44,955	5,925	5,570	71	418
Maranhão	187,118	16,768	15,463	348	1,100
Mato Grosso	81,635	12,992	10,804	1,970	689

Source: IBGE, 2017

5.4.7 Access to Information and Internet

Information dissemination

The dissemination of information is fundamental for the engagement of the interested public in the scope of the Floresta+ Amazônia Pilot Project. In many places, the means for communication are mostly dependent on electrical energy sources.

However, it is common that in locations farther from municipal headquarters, the energy supply is of low quality or even non-existent. Figure 5-37 shows that in six states in the Legal Amazon, 30% or more rural properties do not have electricity, with Amazonas being the state with the most rural properties without electricity, with almost 50%.

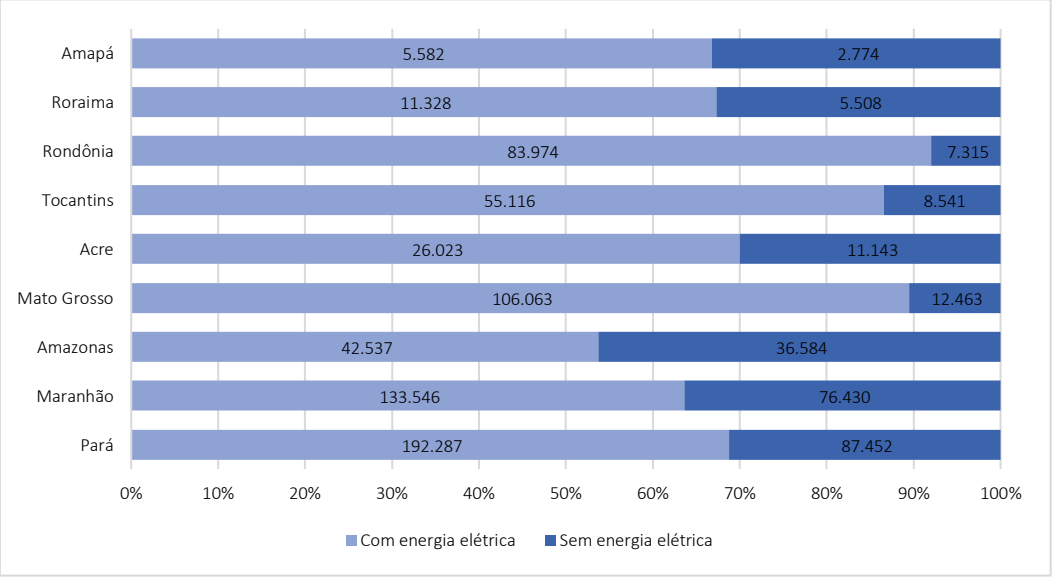


Figure 5-37 Number of rural properties in the states belonging to the Legal Amazon with and without electricity. Source:IBGE (2017).

In rural locations it is possible to obtain information through various means of communication and television is presented as the main way of obtaining technical information, followed by radio and the internet. In addition to these, technical meetings are also one of the main ways of obtaining technical information by rural producers in the Amazon, but an issue that draws attention is the number of producers who do not obtain technical information.

In the states of Rondônia, Tocantins and Mato Grosso just under 20% of rural properties do not obtain any form of technical information. In the other states in the Legal Amazon, the deficit reaches around 30% (Table 5-40).

Table 5-40 Main means of news dissemination on rural properties in states in the Legal Amazon.

Federation Unit	Mean of obtaining technical information received by the establishment								
	Total	Television	Radio	Internet	Magazines	Newspapers	Technical meetings/ Seminars	Other means	Does not receive technicalinformation
Rondônia	91.438	51.683	28.770	13.271	1.992	3.219	11.111	18.909	21.538
Acre	37.356	14.718	12.470	1.365	563	1.666	2.840	7.840	13.051
Amazonas	80.959	23.316	12.284	2.439	916	1.667	6.105	21.373	35.495
Roraima	16.846	6.042	4.000	1.606	769	860	1.452	5.587	5.306
Pará	281.699	103.263	69.690	12.409	4.714	6.544	15.956	75.160	105.876
Amapá	8.507	2.313	824	372	100	129	691	2.630	3.850
Tocantins	63.808	37.974	21.163	5.969	2.062	3.593	6.466	15.375	12.638
Maranhão	219.765	74.299	24.292	5.540	1.841	3.747	8.117	44.635	107.447
Mato Grosso	118.679	72.840	43.761	22.323	8.086	9.472	16.130	31.149	17.675

Quality internet and telephony

The internet is, without a doubt, one of the most significant advances in recent decades. Its popularization began in 1994, and, 25 years later, there is still a lot to grow, especially in the Legal Amazon, where only 63% of households have access to the internet.

Between 2016 and 2017 in the Legal Amazon, this key index increased from 50.9% to 55.4%, mainly due to the expansion of internet access, which ranged from 63.6% to 70.5% in the same period. However, the most critical points of this key index are the low access to the internet, even with the advance (ENDES, 2018). In Amazonas it is even more restricted, and the interior is the place that suffers the most from the difficulty of connection.

The North region, together with the Northeast, is the region with the worst conditions of access to broadband in Brazil, according to the diagnosis contained in the survey on broadband public policy, carried out in 2018 by the TCU (Rule 2,053/2018-TCUPlenário, of 8/29/2018, reported by Minister Ana Arraes).

Table 5-41 Internet profile of the states in the Legal Amazon. Source: IBGE, 2019.

States	Means of requesting access topublic information	Provides forms of service at adistance (internet)	Internet access for the population /Provides access via wi-fi connection
Amapá	Yes	Yes	No
Acre	Yes	Not available	Yes
Amazonas	Yes	Yes	Yes
Roraima	Yes	Yes	Yes
Rondônia	unregistered information	unregistered information	unregistered information
Pará	Yes	Yes	Yes
Tocantins	unregistered information	unregistered information	unregistered information
Mato Grosso	Yes	Yes	Yes
Maranhão	Yes	Yes	Yes

Rural internet in rural areas and small towns in Brazil generally have far fewer internet options than urban areas. The internet is not just surfing the web, it is necessary an infrastructure, antenna network, radios, satellite, fiber optics to reach an internet signal and in many states and municipalities in the Legal Amazon this does not work, leaving these people excluded from accessing the Internet. Being connected is having access to the world, and these people are excluded from this reality. With all the advances in technology in the field, access to the internet in the field is becoming more and more necessary.

According to data from the 2017 Rural Census, more than 80% of rural properties in the Legal Amazon do not have access to the internet, a characteristic that relates to the precarious or non-existent energy issue in these places, in the context that the percentages of internet access in the states of Rondônia, Tocantins and Mato Grosso are very close to the percentages of rural homes that do not have electricity.

In addition, mobile internet is the most present in rural areas of the Brazilian Amazon, except for the states of Rondônia and Mato Grosso, where almost half of rural households have broadband internet.

Even though rural households have access to the internet, almost 96% of rural landowners do not have an e-mail address or do not know their e-mail address, which can be one of the major obstacles to publicizing actions and mobilizing the rural community in locations farther away from the urban centers.

On the other hand, the telephone can be a very important mechanism in the diffusion processes, where around 65% of rural property owners have at least one telephone line in their homes or for personal use. Even so, many rural residents are basically disconnected from the world due to lack of communication, and this can be an aggravating factor in achieving the project's objectives.

Table 5-42 Number of rural properties and their means of communication in states in the Legal Amazon. Source: IBGE2017.

	Telephone, e-mail and internet									
	Total	Has telephone	Has no telephone	Has e-mail	Has no e-mail	Has internet	Has no internet	BroadbandInternet	Internet - dial byline	internet - mobileinternet
RO	91,438	60,485	30,946	3,262	88,168	26,049	65,389	15,974	527	11,593
AC	37,356	16,833	20,522	679	36,676	5,542	31,814	957	87	4,752
AM	80,959	25,457	55,502	1,315	79,644	9,035	71,924	863	160	7,972
RO	16,846	5,219	11,627	408	16,438	1,860	14,986	514	16	1,414
PA	281,699	106,946	174,749	3,797	277,898	35,814	245,885	9,736	494	27,066
AP	8,507	4,039	4,468	225	8,282	1,554	6,953	414	7	1,334
TO	63,808	40,579	23,200	2,238	61,532	11,226	52,582	2,438	159	9,226
MA	219,765	63,936	155,821	2,499	217,258	27,093	192,672	5,810	480	22,406
MT	118,679	89,063	29,615	9,935	108,743	30,764	87,915	16,501	534	16,024

5.4.8 The innovation system in Legal Amazon

As in other regions of the country, the structure of the innovation system in the Amazon is based on a quadruple helix: Higher Education Institutions - IES, Research Institutes - IP, Government organizations and the private sector (which includes agriculture and livestock, industry and the third sector). This analysis is mainly centered on the first three helices, since it is in these sectors that the intellectual and financial capital directly associated with the innovation system and, therefore, its investment capacity is concentrated.

According to the ranking[73] prepared by the National Confederation of Industries - CNI, the states in the Legal Amazon occupy the last positions, in terms of number of establishments, except for Mato Grosso (12th), Pará (14th) and Maranhão (18th) (see Table 5-43). However, in terms of the GDP of the industrial sector, taking as a reference the gross added value of the year 2018, the position of the states in the region changes substantially. The state of Pará occupies the 8th position with R$45.5 billion and Amazonas the 12th position with R$28.9 billion. Tocantins, Amapá, Roraima and Acre are in the last positions with a GDP of less than R$4 billion (Table 5-44). Considering the size of the industrial park and production value, Mato Grosso, Pará and Amazonas would be among the states with the industrial sectors with the greatest potential for innovation.

[73] https://perfildaindustria.portaldaindustria.com.br/ranking?cat=3&id=3160

Table 5-43 Profile of industries in the states: number of industrial establishments (2019). Source: CNI, 2019.

Rank	State	Region	Number of industrial establishments
1	São Paulo	Southeast	121,898
2	Minas Gerais	Southeast	61,426
3	Rio Grande do Sul	South	46,947
4	Santa Catarina	South	45,116
5	Paraná	South	43,543
6	Rio de Janeiro	Southeast	22,280
7	Goiás	Midwest	17,487
8	Bahia	Northeast	16,937
9	Ceará	Northeast	14,027
10	Pernambuco	Northeast	12,690
11	Espírito Santo	Northeast	10,338
12	Mato Grosso	Legal Amazon	9,322
13	Paraíba	Northeast	6,476
14	Pará	Legal Amazon	6,046
15	Rio Grande do Norte	Northeast	6,017
16	Mato Grosso do Sul	Midwest	5,848
17	Distrito Federal	Midwest	5,235
18	Maranhão	Legal Amazon	4,097
19	Piauí	Northeast	3,974
20	Alagoas	Northeast	3,210
21	Rondônia	Legal Amazon	3,207
22	Sergipe	Northeast	3,134
23	Amazonas	Legal Amazon	2,787
24	Tocantins	Legal Amazon	2,264
25	Acre	Legal Amazon	862
26	Amapá	Legal Amazon	556
27	Roraima	Legal Amazon	519

The agricultural and livestock sector is also an important sector for innovation in production processes and considering the gross domestic product of municipalities in 2018, according to the IBGE[74], the agricultural GDP of the Legal Amazon was around R$463.8 billion. The state of Mato Grosso alone accounts for more than ⅓ of this amount. Together with Pará, these two states concentrate more than 62% of agricultural production (Table 5-45). The state of Maranhão, considering only the municipalities included in the Legal Amazon, would be the 3rd largest agricultural power in the region, whose value exceeds the production of municipalities in the same state, but located outside the Legal Amazon. The other states in the region have a GDP of less than R$10 billion.

[74] https://www.ibge.gov.br/estatisticas/economicas/contas-nacionais/9088-produto-interno-bruto-dos-municipios.html?=&t=resultados&utm_source=landing&utm_medium=explica&utm_campaign=pib

Table 5-44 Industrial GDP of the states in 2018 in gross added value (R$ Million). Source: CNI - https://perfildaindustria.portaldaindustria.com.br/ranking?cat=10&id=3155.

Rank	State	Region	GDP
1	São Paulo	Southeast	R$ 391,375.3
2	Rio de Janeiro	Southeast	R$ 149,958.6
3	Minas Gerais	Southeast	R$ 142,819.0
4	Paraná	South	R$ 93,690.6
5	Rio Grande do Sul	South	R$ 88,973.7
6	Santa Catarina	South	R$ 66,293.3
7	Bahia	Northeast	R$ 53,968.7
8	Pará	Legal Amazon	R$ 45,502.4
9	Espírito Santo	Southeast	R$ 37,612.8
10	Goiás	Midwest	R$ 36,092.4
11	Pernambuco	Northeast	R$ 32,358.4
12	Amazonas	Legal Amazon	R$ 28,935.0
13	Ceará	Northeast	R$ 24,796.3
14	Mato Grosso do Sul	Midwest	R$ 21,406.1
15	Mato Grosso	Legal Amazon	R$ 19,398.4
16	Maranhão	Legal Amazon	R$ 16,099.5
17	Rio Grande do Norte	Northeast	R$ 11,372.5
18	Distrito Federal	Midwest	R$ 9,541.3
19	Paraíba	Northeast	R$ 8,849.6
20	Sergipe	Northeast	R$ 7,457.8
21	Rondônia	Legal Amazon	R$ 7,063.0
22	Alagoas	Northeast	R$ 5,869.6
23	Piauí	Northeast	R$ 5,557.7
24	Tocantins	Legal Amazon	R$ 3,942.5
25	Amapá	Legal Amazon	R$ 1,826.9
26	Roraima	Legal Amazon	R$ 1,355.5
27	Acre	Legal Amazon	R$ 1,093.0

Table 5-45 Sum of Gross Added Value of Agriculture (IBGE, 2018).

State	Legal Amazon	Total (R$ billion)	% of region
MT	Yes	169.5	36.5
PA	Yes	118.6	25.6
MA	Yes	51.6	11.1
AM	Yes	43.8	9.4
RO	Yes	36.2	7.8
TO	Yes	27.6	5.9
AC	Yes	10.5	2.3
MA	No	6.3	-
RR	Yes	3.6	0.8
AP	Yes	2.4	0.5
Global Total	Yes	463.8	

Considering that the conversion of areas with native forest cover as the environmental cost (or externality) resulting from this agricultural production, the ecological efficiency of production in each state can be estimated for comparative purposes (Figure 5-38). Taking as a reference the accumulated deforestation until 2018, according to the data released by INPE[75] PRODES system and the relation with the agricultural GDP of that year, the states of Tocantins, Maranhão and Matogrosso have GDP values above the expected average. Amazonas is very close to the estimated average for its deforested area. Amapá, Acre, Roraima, Rondônia and especially Pará would be the states that presented GDP below expectations considering their accumulated areas of deforestation. Acre, Amazonas, Amapá and Roraima concentrated the municipalities with the worst levels of agricultural modernization in the region. Amapá, in turn, only presented localities with degrees of low or very low modernization, which is worrying for the development of this state, as the primary sector has great relevance in the regional context, except that it has the potential to develop an alternative agricultural model of areas with the highest degree of technification (Lobão and Staduto, 2020).

However, Tocantins, Maranhão and Mato Grosso are states with large agricultural areas in the Cerrado biome that may have contributed greatly to the increase in GDP. These agricultural areas in another biome are not accounted for in the PRODES calculations, which exclusively measure areas with potential coverage of the Amazon forest. By this criterion, the state of Mato Grosso would have the most ecologically efficient agricultural production. These states located in the south and east of the region (Eastern Amazon) show the best degrees of agricultural modernization and are associated with the expansion of the agricultural frontier of modernized production (Lobão and Staduto, 2020).

[75] http://terrabrasilis.dpi.inpe.br/app/dashboard/deforestation/biomes/legal_amazon/increments

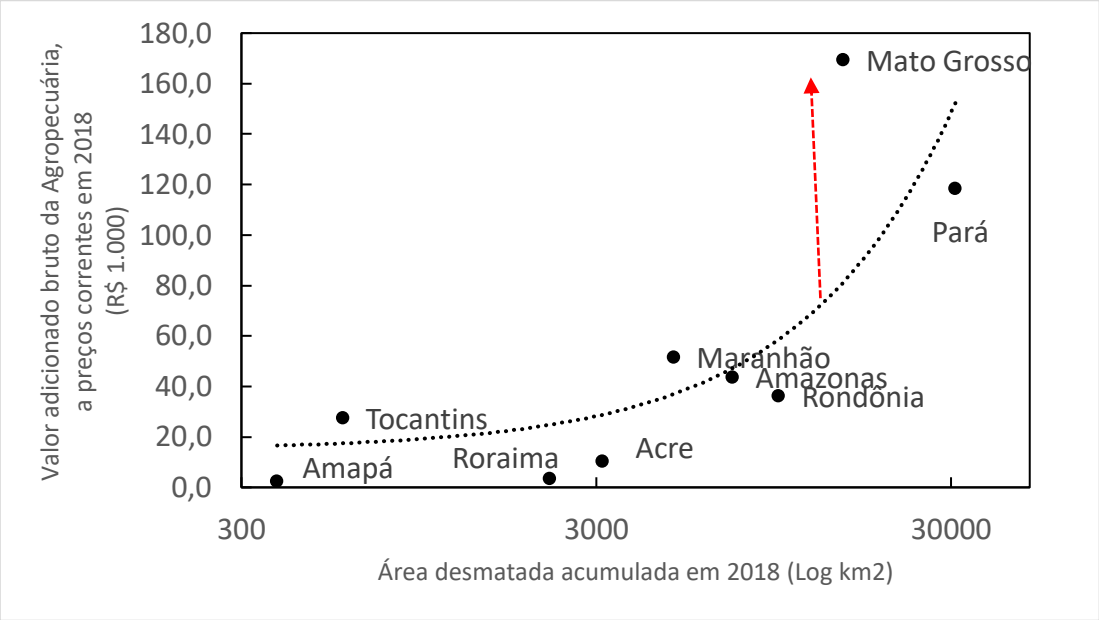


Figure 5-38 Relation between agricultural GDP and accumulated deforestation in the states of the Legal Amazon for theyear 2018. SOURCE: GDP – IBGE, deforestation – PRODES/IBGE

In the Legal Amazon, as well as in other regions and in several other countries, universities and research institutes are the organizations that concentrate the production of scientific and technological knowledge that drives innovation processes (Silva, 2019). However, the region is home to only 31 public universities, i.e. 10% of the total of these universities in the country, which are the IES that hold the majority of this production (Table 5-46). Still, according to the CWTS Leiden Ranking 2020[76], which is based on bibliographic data from the Web of Science database produced by Clarivate Analytics, of the 30 Brazilian universities analyzed, only two are from the region: Federal University of Pará (25th) and Federal University of Mato Grosso (28th).

Table 5-46 Number of Higher Education Institutions and percentage (%) of the national total, by Academic Organization, by Federation Unit and Administrative Category of IES - 2019. Source: Higher Education Census 2019 (National Institute of Studies and Researches Anísio Teixeira, 2020).

	Total (n)	% (Total)	Universities (%)	University Centers (%)	Colleges (%)	IF and CEFET (%)
Public	31	10.3	21 (10.6)		1 (0.0)	9 (22.5)
Private	283	12.3	4 (4.4)	26 (9.2)	253 (13.1)	0
Total	314	12.0	25 (12.6)	26 (9.2)	254 (13.2)	9 (22.5)

Notes: IF and CEFET - Federal Institute of Education, Science and Technology and Federal Center for Technological Education

In 2019, the region had approximately 720,000 students enrolled in on-site undergraduate courses, corresponding to only 11.7% of the country's total (Table 5-47). The state with the highest number of enrollments was the state of Pará, followed by Maranhão, Amazonas and Mato Grosso, all with more than 100,000 students. Pará is also the only state in which the number of people enrolled in universities is greater than those enrolled in university centers and private colleges. In Rondônia, this number is almost four times greater than the number of enrollments in public universities, indicating that this is the state with the greatest gap in the offer of vacancies in the public higher education network.

[76] https://www.leidenranking.com/ranking/2020/list

Table 5-47 Enrollments in On-Campus Undergraduate Courses, by Academic Organization and Location (Capital andInterior), according to Federation Unit and Administrative Category of IES – 2019. Source: MEC/INEP/DEED.

State / Administrative Category	Global Total	Universities	University Centers	Colleges	IF and CEFET
Brazil	6,153,560	3,086,414	1,339,577	1,526,544	201,025
Pará	155,516	83,935	16,177	51,529	3,875
Maranhão	149,862	71,628	7,830	63,830	6,574
Amazonas	129,241	63,926	45,487	18,098	1,730
Mato Grosso	118,322	54,065	16,235	40,629	7,393
Tocantins	50,421	19,585	12,443	14,138	4,255
Rondônia	48,754	9,324	11,699	24,813	2,918
Amapá	29,608	10,379	0	17,674	1,555
Acre	22,830	8,832	10,580	1,702	1,716
Roraima	16.604	7,796	4,442	3,167	1,199
Legal Amazon (total)	721,158				

Notes: 1 - IF/CEFET - Federal Institute of Education, Science and Technology and Federal Center for Technological Education. 2 - The Regions and Federation Units correspond to the place where the Course is offered.

However, if the population of the state is considered to estimate the enrollment rate per thousand inhabitants, the states with the best performance are Amapá (~35 enrollments) and Mato Grosso (~34 enrollments). Pará being the most populous state is in the last position with about 18.1 enrollments per 1,000 inhabitants. All other states have rates above 21 enrollments (Figure 5-39).

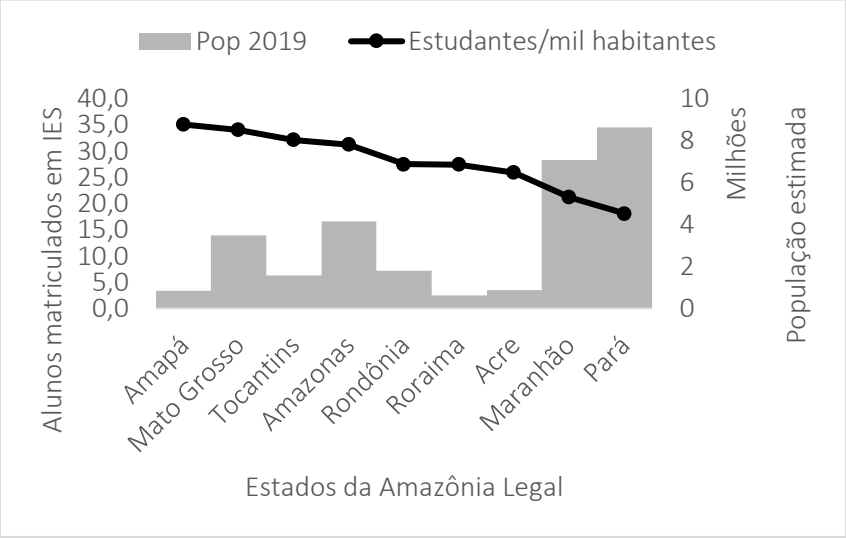


Figure 5-39 Population estimate and enrollment rate in HEI per thousand inhabitants in the states of the Legal Amazonfor the year 2019. Sources: Enrollments - MEC/INEP/DEED; Population estimate – IBGE.

The number of qualified teachers is also an important indicator for assessing the region's innovation potential. Of the country's total, the region held 11% of the teaching staff of the IES. The state with the highest number of teachers in Higher Education Institutions is Pará with 23% of the region's total (Table 5-48). As for the number of professors with doctorates who are the professionals responsible for research with the greatest potential for innovation, the region represented in 2019 about 16 thousand professionals, that is, around 8.9% of this

category at the national level. The states with the smallest number of professors holding a doctorate are Rondônia, Acre, Roraima and Amapá, all with less than 900 professors holding a doctorate, in that descending order.

Table 5-48 Total Number of Teachers (In-service and On Leave), by Academic Organization and Level of Education,according to Federation Unit and Administrative Category of IES – 2019. Source: MEC/INEP/DEED.

Federation Unit /Administrative Category	Total	No. Graduation	Graduation	Specialization	Master	Doctorate
Brasil	399428	13	3675	62797	150689	182254
Pará	9999	0	163	1419	4087	4330
Mato Grosso	8961	0	283	2252	3049	3377
Maranhão	7911	0	66	1972	3201	2672
Amazonas	5322	0	111	934	2343	1934
Tocantins	3597	0	83	918	1352	1244
Rondônia	3256	0	39	1013	1306	898
Amapá	1832	0	13	563	722	534
Acre	1630	0	81	359	559	631
Roraima	1318	0	38	189	544	547
Legal Amazon	43826	0	877	9619	17163	16167

Notes: 1- IF/CEFET - Federal Institute of Education, Science and Technology and Federal Center for Technological Education. 2 - The same professor can work in one or more institutions.

One of the most effective forms of investment in human capital for qualification and research processes is scholarships. According to data from CAPES, Coordination for the Improvement of Higher Education Personnel (CAPES), foundation of the Ministry of Education (MEC), which is responsible for promoting and evaluating stricto sensu postgraduate courses (master's and doctorate) in all states of the Federation, the states in the Legal Amazon are among those that received the lowest number of scholarships in the country (Figure 5-40 Distribution of graduate programs in Brazil, 2013 data. Source: https://geocapes.capes.gov.br /geocaps/).

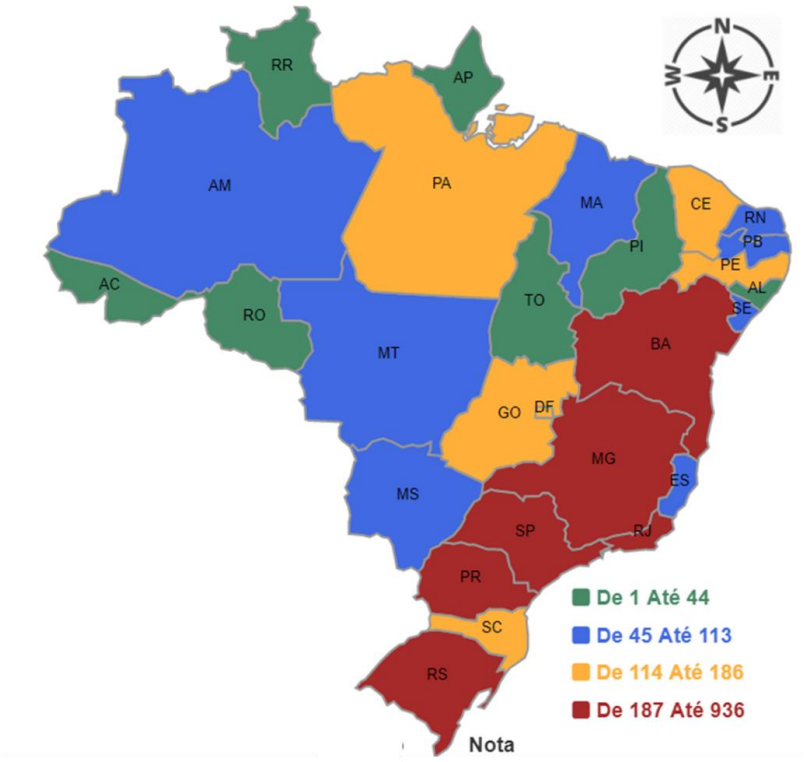


Figure 5-40 Distribution of graduate programs in Brazil, 2013 data. Source: https://geocapes.capes.gov.br/geocapes/.

The region received only 6.2% of doctoral scholarships, 9.2% of master's scholarships and 8.6% of postdoctoral scholarships in the country. The latter could represent an important strategy to increase the retention of skilled labor in the region (Table 5-49 Distribution of CAPES Postgraduate Scholarships in Brazil by State in 2020. Source: CAPES. https://geocapes .capes.gov.br/geocapes/).

Table 5-49 Distribution of CAPES Postgraduate Scholarships in Brazil by State in 2020. Source: CAPES. https://geocapes.capes.gov.br/geocapes/.

UF	FULL DOCTORATE and Professional	IC and Young Talents	Academic and Professional Masters	Visiting Professor/Researcher	Post doctoral	Total
PA	902	4	1147	11	119	2183
MT	309	8	617	0	45	979
AM	347	1	473	4	73	898
MA	197	0	278	5	60	540
TO	902	4	1147	11	119	2183
RO	71	0	112	3	12	198
AC	57	0	118	2	10	187
AP	36	0	68	5	8	117
RR	27	0	55	2	8	92
Legal AMZ	2848	17	4015	43	454	7377
Brazil	46110	176	43501	48	5281	95116

Between 2015 and 2018, the regulatory framework in the area of Science, Technology and Innovation was modified through Constitutional Amendment No. 85/2015, Law No. 13,243/2016 and Decree No. 9,283/2018 a set of rules that became known as CT&I Legal Framework. In 2020, the CGU carried out a diagnosis[77] of the implementation of this legislation and considered that there had been significant advances in recent decades in terms of Brazilian participation in world scientific production, which rose from 0.7% in 1991 to approximately 3% in 2014. According to the CGU, in 1996, approximately 10,000 masters and 2,000 doctors had been trained – in 2014, the data indicate 50,000 new masters and 16,000 new doctors. However, for innovations to occur, the discoveries and inventions generated need to be transferred to society and to the productive sector. Although advances in scientific production have been observed, the growth in the number of patents filed by residents in the country was only 24% in the period 2000-2014.

The country's current innovation policy presupposes the promotion of innovation through interaction between actors, simultaneously involving knowledge resulting from the experiences accumulated by different organizations, both in their own performance and in their interaction with others (companies, institutions of teaching and research) other actors and the environment in which they operate (Cassiolato and Lastres, 2017). In this interaction, the Technological Innovation Center (NIT) of Scientific, Technological and Innovation Institutions (ICTs) would have a fundamental role.

In an ordinance published on January 30, 2021, the Ministry of Science, Technology and Innovation (MCTI) established four arrangements of Technological Innovation Centers (NIT), with their respective research units and member social organizations. The arrangements are provided for in the Innovation Law. The law provides that several scientific and technological entities come together to form a common NIT, instead of each institution formulating its own NIT. The NIT Eastern Amazon Arrangement is integrated by the Museu Paraense Emílio Goeldi - MPEG, which hosts the NIT Arrangement. The Western Amazon NIT Arrangement is formed by:

a) National Institute for Amazonian Research - INPA, which will host the NIT Arrangement; and b) Mamirauá Sustainable Development Institute - IDSM. These arrangements will be linked to the coordination and supervision of the MCTI's Sub-secretariat for Coordination of Research Units (SCUP).

However, the CGU report informs that even in those units where technology transfer could be relevant, the entrepreneurial culture is still in its infancy. The licensing fees in the Legal Amazon found by CGU corroborate this finding: INPA licensed two of its protected technologies (2.75%); and MPEG does not have signed technology transfer agreements (9 protected technologies).

Within the organizational structure of MCTIC, research and development, scientific and technological activities are competences of 16 Research Institutes, identified as Research Units. All are bodies of direct administration and have federal civil servants from the C & T career in their staff (Brasil, 2016). In addition to the Research Institutes, the Ministry of Science, Technology, Innovation and Communications has management contracts with 6 Social Organizations to carry out scientific research and technological development activities in specific areas. The National Institute for Research in the Amazon (INPA) was then constituted as a Public Research Institute of the Ministry of Science, Technology, Innovation and Communications. The creation of INPA by CNPq, in 1951, as a pioneering institution, represented the national political response to the role of the Amazon as a scientific frontier, in opposition to the project presented to UNESCO for the creation of the International Institute of Hileia Amazônica – IIHA. Something similar was only to be taken up again by the Amazon countries, years later, with the signing in 1978 of the Amazon Cooperation Treaty, once again by Brazilian initiative (Petitjean; Domingues, 2001; Faulhaber, 2005; Magalhães; Maio, 2007).

The Indicators published in the Management Commitment Terms (TCG), a performance management instrument signed between each MCTI Research Institute and the Ministry itself, make it possible to assess the efficiency of INPA's management in recent years. INPA has about 600 active employees, with 178 researchers, 77% of whom have a doctorate (Silva; Costa, 2017). However, the organization has been losing its workforce, compromising the continuity of its production (Manzi et al., 2015). Since 2006, the workforce has dropped by

[77] https://auditoria.cgu.gov.br/download/14116.pdf

27%, from 769 to 561 employees (FSP, 2018). This institutional scenario shows a tendency to worsen in a very short period, since in 2020, 47% of the staff would already be inactive.

EMBRAPII (Brazilian Association of Industrial Research and Innovation) is a Social Organization[78] qualified by the Federal Government that, since 2013, supports technological research institutions fostering innovation in Brazilian industry. Its mission is to support technological research institutions, in selected areas of competence, to carry out technological research development projects for innovation, in cooperation with companies in the industrial sector. EMBRAPII works through cooperation with scientific and technological research institutions, public or private, focusing on business demands and targeting risk sharing in the pre-competitive phase of innovation. By sharing project risks with companies, it aims to encourage the industrial sector to innovate more and with greater technological intensity, thus enhancing the competitive strength of companies in both the domestic and international markets. The Federal Institute of Amazonas (IFAM) is the only CT&I organization in the region to be accredited by EMBRAPII[79] to serve the national industry in the development of RD&I in the area of technologies for manufacturing processes, with two sublines: Devices for automation and control and Software and systems for industrial processes.

According to CONFAP[80] - National Council of State Research Support Foundations, an organization that brings together 26 Research Support Foundations (FAPs), and integrates the National Science, Technology and Innovation System, the state of Roraima is the only one that does not have its state foundation, within the states of the region. One of the initiatives in which CONFAP participates is the Centelha Program[81]. This program aims to encourage the creation of innovative ventures and disseminate the entrepreneurial culture in Brazil. The program will provide training, financial resources and support to transform ideas into successful businesses. The initiative is promoted by the Ministry of Science, Technology and Innovation (MCTI) and by the Financier of Studies and Projects (Finep), in partnership with the National Council for Scientific and Technological Development (CNPq) and the National Council of State Foundations for Support to Research (Confap), and operated by the CERTI Foundation. In the region, however, only the states of Amapá, Amazonas, Maranhão and Mato Grosso participate in the first edition of the Centelha Program.

Innovation processes invariably involve several institutions, and even in each institution it is never an individual work or small teams. Thus, it is important to assess the organization of research centers and groups in the region. According to the Directory of Research Groups in Brazil[82], the distribution of research groups according to the Federation Unit, in 2016, was a clear indication of the low density of these groups in the states of the region (Table 5-50). The states of Pará (11th position), Mato Grosso (17th position), Amazonas (18th position) and Maranhão (20th position) were the ones that presented the best performances. The other states in the region occupied the last positions in this ranking.

[78] Social Organizations are private, non-profit legal entities whose activities are aimed at teaching, scientific research, technologicaldevelopment, protection and preservation of the environment, culture and health
[79] https://embrapii.org.br/unidades-embrapii/
[80] https://confap.org.br/pt/confap
[81] https://programacentelha.com.br/
[82] http://lattes.cnpq.br/web/dgp/home

Table 5-50 Distribution of research groups according to Federation Unit, 2016.

Rank	Federation Unit	Groups	%	Region
1	São Paulo	7447	19.8	Southeast
2	Rio de Janeiro	4360	11,6	Southeast
3	Rio Grande do Sul	3601	9,6	South
4	Minas Gerais	3477	9,2	Southeast
5	Paraná	3174	8,4	South
6	Santa Catarina	1862	5	South
7	Bahia	1821	4,8	Northeast
8	Pernambuco	1316	3,5	Northeast
9	Paraíba	1056	2,8	Northeast
10	Ceará	976	2,6	Northeast
11	Pará	960	2,6	Legal Amazon
12	Distrito Federal	867	2,3	Midwest
13	Mato Grosso do Sul	742	2	Midwest
14	Espírito Santo	725	1,9	Southeast
15	Goiás	711	1,9	Northeast
16	Rio Grande do Norte	694	1,8	Northeast
17	Mato Grosso	579	1,5	Legal Amazon
18	Amazonas	547	1,5	Legal Amazon
19	Alagoas	517	1,4	Northeast
20	Maranhão	493	1,3	Legal Amazon
21	Sergipe	451	1,2	Northeast
22	Piauí	389	1	Northeast
23	Tocantins	297	0,8	Legal Amazon
24	Amapá	168	0,5	Legal Amazon
25	Rondônia	156	0,4	Legal Amazon
26	Roraima	141	0,4	Legal Amazon
27	Acre	113	0,3	Legal Amazon
	Total	37640	100	

In all of the indicators analyzed, trends were observed for the states in the Legal Amazon region to present the lowest performances when compared to most other states in the country. In intra-regional terms and considering the average of the states' positions for the set of 9 indicators analyzed (Table 5-51), the four states with the greatest potential for innovation in the legal Amazon would be the state of Mato Grosso, followed by the states of Pará, Amazonas and Maranhão, in that order. To reduce internal asymmetries in the region, incentive policies should be adopted for the states of Rondônia, Amapá, Acre and Roraima.

Table 5-51 Synthesis of the positions of the States in the Legal Amazon according to the innovation indicators.

State	No. Industries	Industry GDP	Agriculture and livestock GDP	GDP/Deforestation	IES	Faculty	Enrollments	Grants	Groups	Average
MT	1	3	1	2	4	2	2	2	2	2.1
PA	2	1	2	6	1	1	9	1	1	2.7
AM	5	2	4	5	3	4	4	3	3	3.7
MA	3	4	3	3	2	3	8	4	4	3.8
TO	6	6	6	1	5	5	3	5	5	4.7
RO	4	5	5	7	6	6	5	6	7	5.7
AP	8	7	9	4	7	7	1	8	6	6.3
AC	7	9	7	8	8	8	7	7	9	7.8
RR	9	8	8	9	9	9	5	9	8	8.2

5.5 BIODIVERSITY

Brazil occupies almost half of South America and is the country with the greatest biodiversity on the planet. There are more than 116,000 animal species and more than 46,000 plant species known in the country[8384].

The rich Brazilian biodiversity is a source of resources for the country, not only for the ecosystem services provided, but also for the opportunities that represent its conservation, sustainable use and genetic heritage[85].

Vegetation is one of the most important components of the biota and its state of conservation and continuity allows for the existence or not of habitats not only for fauna species but also for the maintenance of fundamental ecosystem services in the supply of essential goods for survival of human populations.

5.5.1 The Biomes in Brazil

The different climatic zones, in interaction with geology, soils, relief, as well as evolutionary adaptations result in the formation of biomes (biogeographic zones), which have distinct characteristics: Amazon, Caatinga, Cerrado, Mata Atlântica, Pampa and Pantanal (Figure 5-41 Map of the six Brazilian biomes, as defined by IBGE (Souza et al 2020).

[83] Biodiversidade — Português (Brasil) (www.gov.br) (accessed on 03/05/2021)
[84] Fauna Ameaçada de Extinção | IBGE (https://www.ibge.gov.br/geociencias/informacoes-ambientais/biodiversidade/15810-fauna-ameacada-de-extincao.html?=&t=o-que-e (accessed on 03/05/2021
[85] https://www.gov.br/mma/pt-br/assuntos/biodiversidade (accessed on 03/05/2021)

Figure 5-41 Map of the six Brazilian biomes, as defined by IBGE (Source: Souza et al 2020)[86]

The Amazon Biome, occupying 4.2 million km2 (about 49.5% of the national territory) is the biome with the largest occupied area in Brazil, followed by the Cerrado, Mata Atlântica, Caatinga, Pampa and Pantanal, the latter covering 2,3% of the country (Figure 5-42). The Amazon Biome occupies almost the entire Northern Region of the country (93.2%), encompassing entirely the States of Acre, Amapá, Amazonas, Roraima, almost the entire State of Pará and Rondônia, and parts of the States of Mato Grosso, Maranhão and Tocantins (IBGE, 2019)[87].

[86] Souza et al (2020). Reconstructing Three Decades of Land Use and Land Cover Changes in Brazilian Biomes with Landsat Archiveand Earth Engine. *Remote Sens.* 2020, *12*(17), 2735; https://doi.org/10.3390/rs12172735

[87] IBGE, 2019. Biomes and coastal-Marine system in Brazil – compatible with 1:250000 scale. Série Relatórios Metodológicos volume 45. Rio de Janeiro

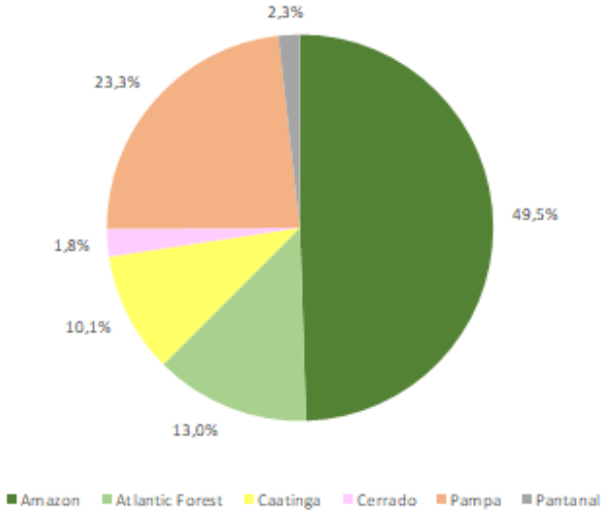


Figure 5-42 Area occupied by biome in relation to the territorial area of Brazil (Source: IBGE)[88].

Each of the biomes has different types of vegetation and fauna. The Amazon and Mata Atlântica are predominantly forest biomes. Focusing the analysis on the Amazon biome (Figure 5-43), at the vegetation level, the cover is predominantly represented by the Ombrophilous Forest (68.86%). It should be noted that 96.7% of the humid rainforest, 98.8% of the open rainforest and 99.9% of the evergreen seasonal forest occur in the Amazon biome (Source IBGE).

However, analyzing the different types of vegetation in the Amazon biome, although it is a predominantly forest biome, it has a very diverse set of other types of vegetation, as can be seen from the analysis of the following Figure.

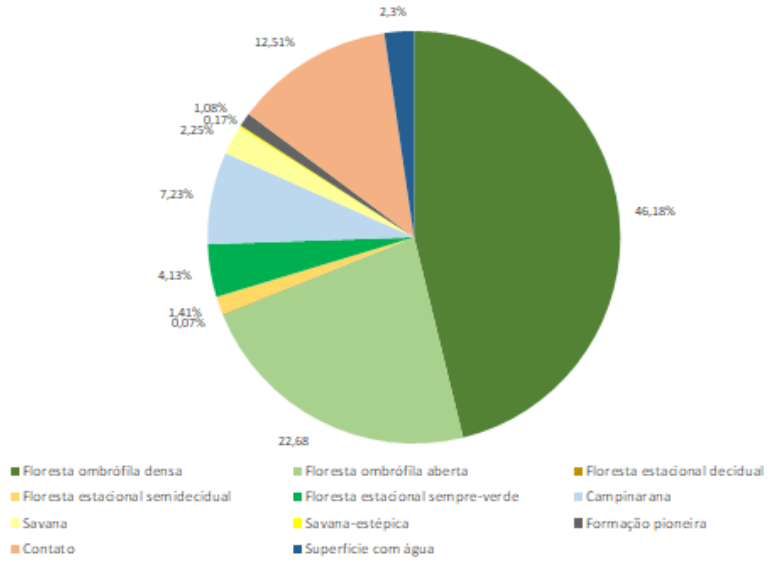


Figure 5-43 Area occupied by vegetation type in the Amazon biome (Source: IBGE)[89].

Despite the current richness and exuberance of Brazilian biodiversity, especially fauna, its future conservation is somewhat uncertain. It is predicted that, in a few decades, several species may become extinct, especially the endemic ones. The causes of extinction are numerous, with emphasis on the deforestation of forests,

[88] IBGE. Biomes and Coastal Marine System of Brazil (Volume 45) (available from https://www.ibge.gov.br/apps/biomas/ accessed on April 3rd 2021.
[89] IBGE. Biomes and Coastal Marine System of Brazil (Volume 45) (available from https://www.ibge.gov.br/apps/biomas/ accessed on April 3rd 2021.

logging, opening of roads, pollution, sport and predatory hunting, illegal trade in animals, among others. Actions of this nature contribute directly or indirectly to the destruction of the species' natural habitats, putting their survival at risk (IBGE - Fauna Threatened with Extinction[90]).

According to information provided by the Ministry of the Environment (MMA) in relation to species threatened with extinction, in the set of Brazilian Biomes (including the oceanic islands and the marine environment, in 2020, there would be 3286 threatened species (threat categories: Vulnerable; Endangered; Critically Endangered), that is, species included in the Official National List of Endangered Species of Flora and Fauna, published by MMA Ordinances No. 443, 444 and 445/2014[91].

Considering the endangered species that are unique to each biome, the biome with the highest number of endangered species is the 'Mata Atlântica', followed by the 'Amazon'. Considering that many species occur in two or more biomes simultaneously, the Mata Atlântica continues to be the biome with the highest number of threatened species, followed sequentially by the Cerrado, Caatinga and Amazon (Figure 5-44).

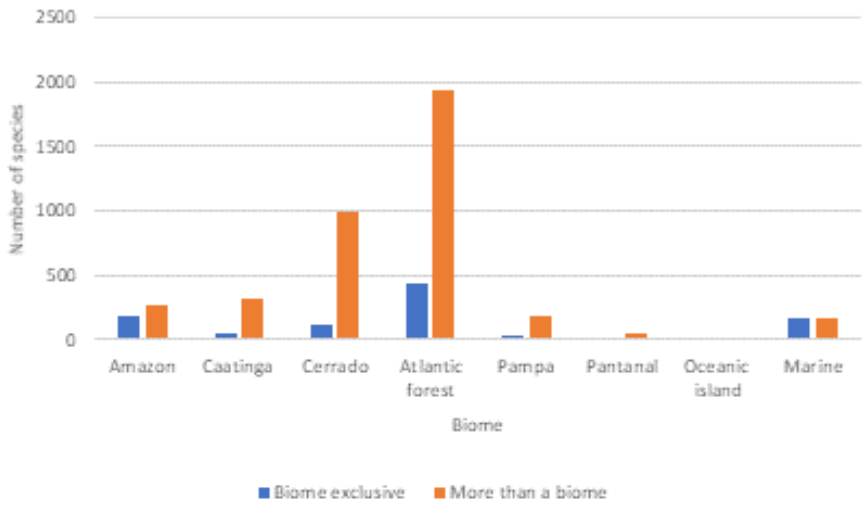


Figure 5-44 Number of Endangered Species by Biome (Source: MMA, 2020. Open Data Portal).

Of the 3286 species threatened with extinction in Brazil, 35.7% are fauna and 64.3% are flora. Transposing this reality only to the Amazon biome, in which there are 184 endangered species that are exclusive to this biome, the situation is inverted as 67.5% are fauna against 32.6% flora.

The causes of threat and decline of species of flora and fauna occurring in the 'Amazon' biome are very diverse. However, with rare exceptions related to 'natural disasters' and 'changes in the dynamics of native species (pathogens/parasites), the main causes of threat originate from human activities.

'Agriculture', 'energy-related economic activities', 'timber/forest extraction', 'direct logging: hunting and fishing', 'human settlements' and 'mining' are the main causes of threat for species. For a significant part of the species concerned, some of these threat factors are the main, if not the only, threat cause in this biome that contributes to the species' threat status (Figure 5-45):

- 'Agriculture and livestock', which alone is a threat to 22 species: 77% are fauna species, especially birds,but also some fish, mammals, reptiles and amphibians;
- 'Energy-related economic activities' alone threaten 35 species, all fauna: 85.7% of which are continental fishL;
- 'Timber extraction/forest extraction' alone contributes to the affectation of 15 species: the

[90] https://www.ibge.gov.br/geociencias/informacoes-ambientais/biodiversidade/15810-fauna-ameacada-de-extincao.html?=&t=o-que-e

[91] Espécies Ameaçadas - Conjuntos de dados - Portal de Dados Abertos do MMA/SFB (consultado em 03/05/2021)

majority (80%) are flora species;

- 'Mining' calls into question the conservation of 6 species of flora and 7 of invertebrates.

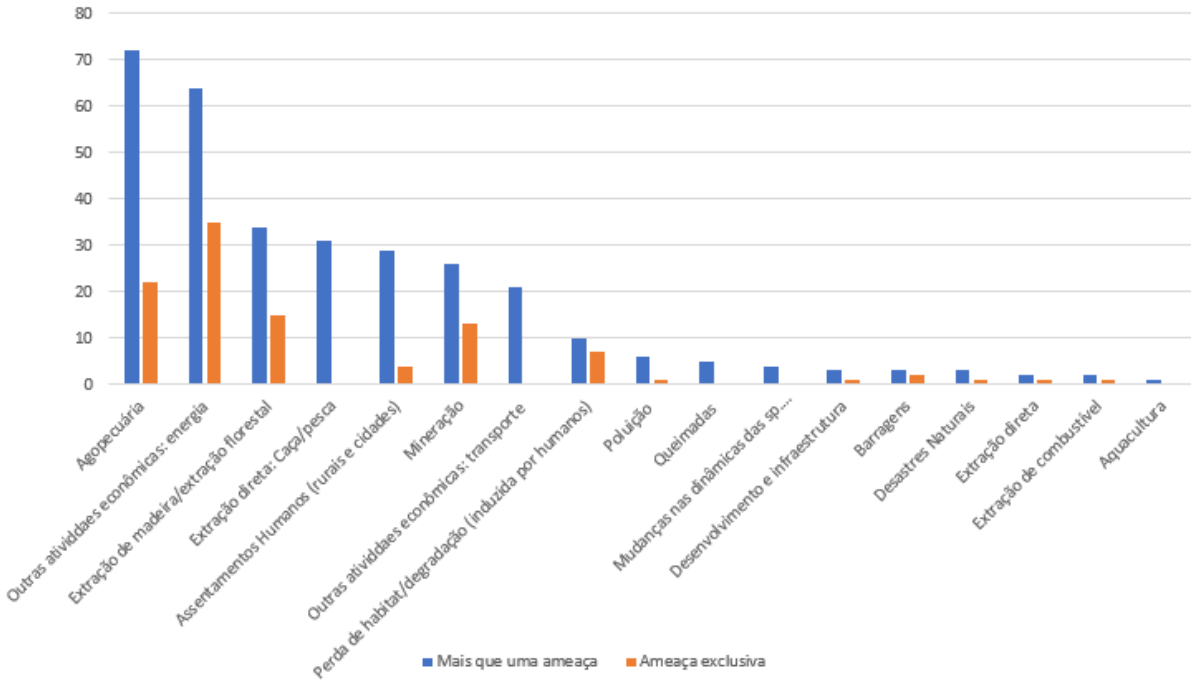


Figure 5-45 Representation of the causes of threat to species present in the 'Amazon' biome (Source: MMA, 2020. Opendata portal).

5.5.2 Deforestation in Brazil

The Amazon is the largest tropical forest area on the planet. A region unto itself, the forest drives a partially self-sustaining regional climate and a hydrological system believed to be at increasing risk of collapse (Sampaio et al., 2007; Lovejoy and Nobre, 2018). Far from being homogeneous, the Amazon incorporates from mountainous forests to mangroves, in a variety of different soils and substrates, integrated by a biogeochemically diverse riverine network that leads to extensive seasonal flooding (Hess et al., 2015).

Human impacts across the basin are equally diverse and heterogeneous, reflecting the numerous distinct ecological, political, socioeconomic and cultural units that lie within its boundaries (Figure 5-46).

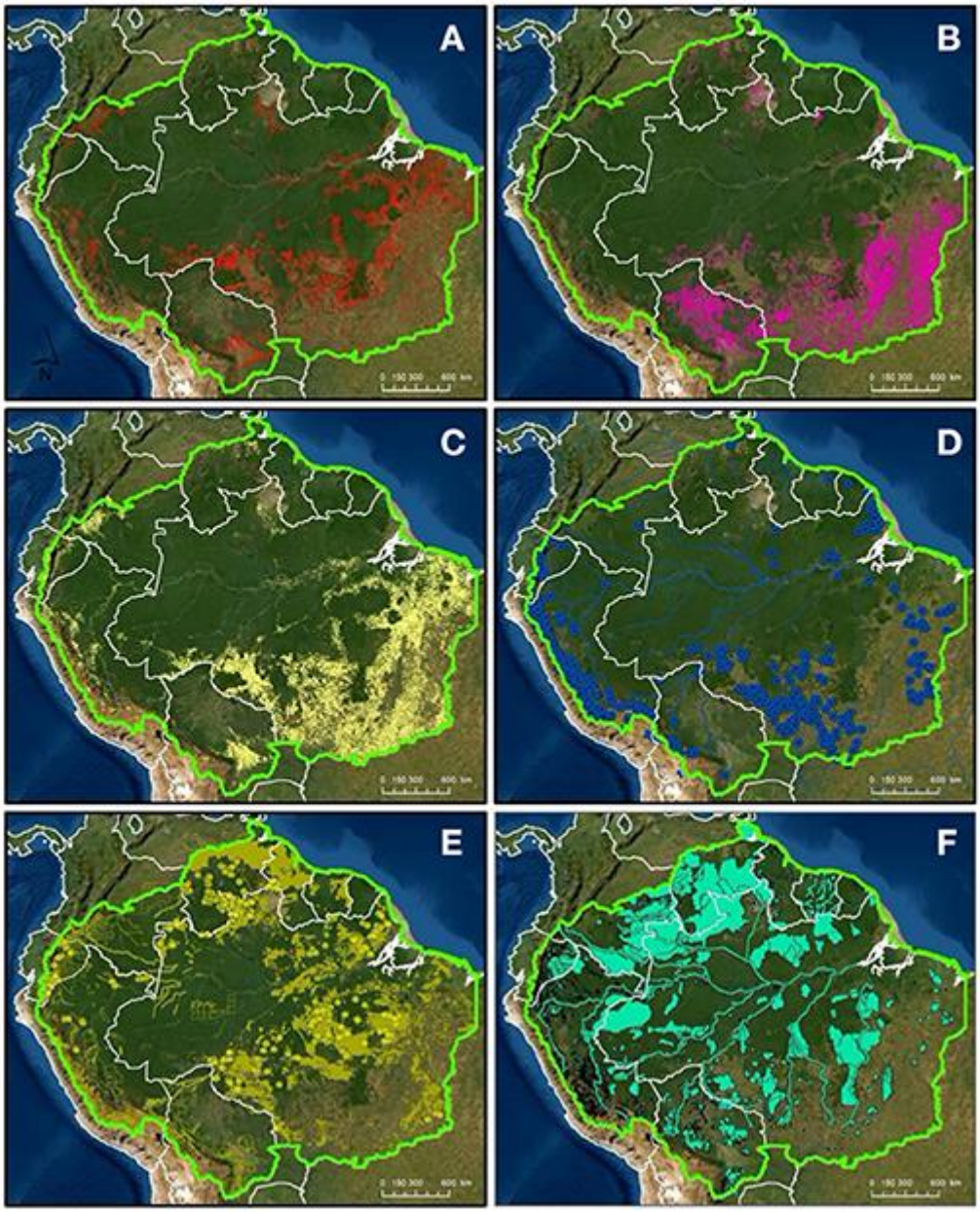


Figure 5-46 Social and economic drivers of land use in the Amazon: (A) forest loss 2001–2019 (shaded red), (B) fires 2001–2019 (shaded pink), (C) agricultural and livestock areas (shaded yellow), (D) hydroelectric power and reservoirs (blue dots), (E) oil extraction and mining areas (shading and yellow dots) and (F) fishing and hunting areas (aqua shading)(Kristofer et al., 2021).

Deforestation, being the first step in changing the use and occupation of land, namely for agribusiness, ends up being considered the biggest cause of loss of biodiversity in the Amazon. And at stake are not only already known species, as well as those that have not even been documented yet, and among these many are identified when their survival is already at risk. Every year, new species of plants and animals are discovered in the Amazon, many of which are already at risk due to deforestation and agribusiness, among others.

In the 'Amazon' biome, between 1985 and 2019 (Figure 5-47) the area of 'Natural Forest' decreased by 43 499 894 ha (11.5%), while agriculture increased by 42 522 940 ha (257%) (Source: MAPBIOMAS, 2021)[92].

[92] https://plataforma.brasil.mapbiomas.org/, accessed April 2021.

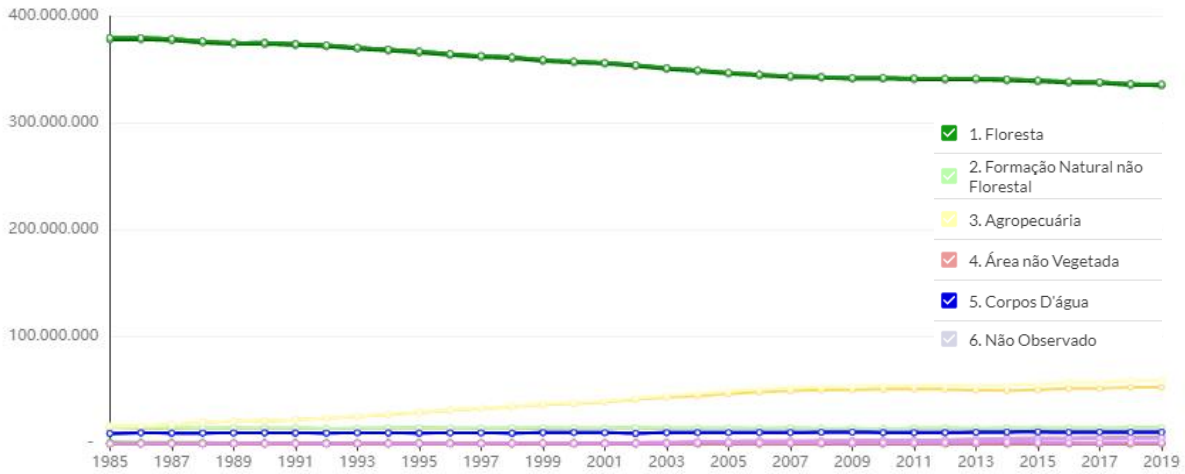


Figure 5-47 Evolution of land use and land cover between 1985 and 2019 (values in ha) (Source: MAPBIOMAS, 2021)

Figure 5-48 shows a map illustration of the evolution of level 1 land use classes between 1985 and 2019 in the Amazon biome (MAPBIOMAS, 2021).

Bearing in mind that the Pilot Project target of this environmental impact assessment is not restricted to the Amazon Biome, covering the entire 'Legal Amazon', it is important to differentiate both concepts. The 'Legal Amazon', in addition to including the entire Brazilian Amazon biome, still contains 20% of the Cerrado biome and part of the Pantanal in Mato Grosso, covering the entire state of Acre, Amapá, Amazonas, Mato Grosso, Pará, Rondônia, Roraima and Tocantins and part of the State of Maranhão.

According to MapBiomas (2021), forest cover (includes native forest, planted forest and secondary vegetation) makes up 75% of the area in the Legal Amazon, followed by agricultural area (17%), non-forest natural formation (5 %), water bodies (2%) and other non-vegetated formation (0.2%). Between 1985 and 2019, more than 721,000 km² of forest areas underwent a transition to agriculture in the region. Similar data can be found on the TerraClass website[93].

Next, an analysis of the deforestation situation is presented, considering the project for monitoring the deforestation of the Brazilian Amazon Forest by Satellite, the so-called PRODES[94] project. This project carries out satellite monitoring of clear-cut deforestation in the Legal Amazon and has produced, since 1988, the annual deforestation rates in the region, which are used by the Brazilian government to establish public policies.

PRODES uses LANDSAT class satellite images to record and quantify deforested areas larger than 6.25 hectares, considering the suppression of native vegetation as deforestation, regardless of the future use of these areas.

[93] http://www.terraclass.gov.br
[94] http://www.obt.inpe.br/OBT/assuntos/programas/amazonia/prodes

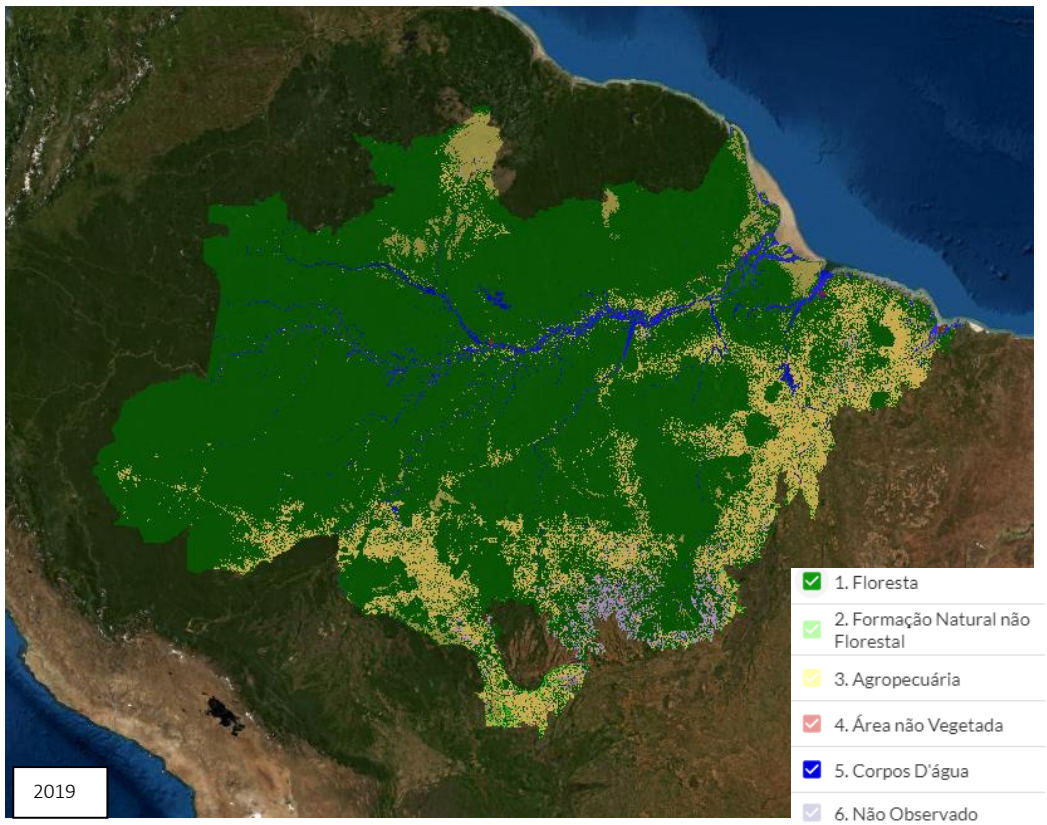


Figure 5-48 Land Use and Coverage in 1985 and 2019 (Source: https://plataforma.brasil.mapbiomas.org/)

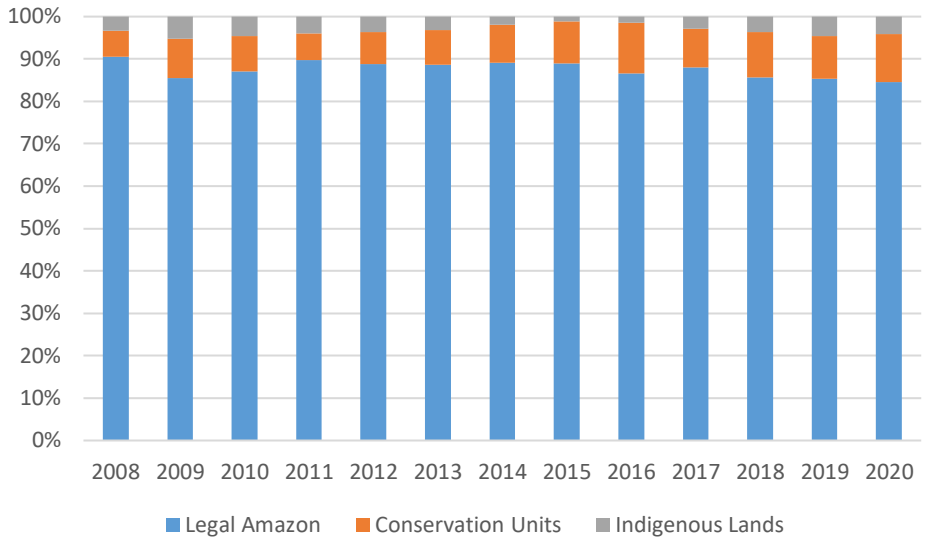


Figure 5-49 Relation between deforestation carried out inside and outside protected areas of the Legal Amazonbetween 2008 and 2020 (Source PRODES, 2021)

From the analysis of the data, it appears that deforestation inside conservation units, as with indigenous lands, is significantly lower than in unprotected areas, although in more recent years (2018, 2019, 2020) there is a trend growth in these protected areas, which may tend to constitute a growing threat to the biodiversity present there.

Although the area included in the Conservation Units and Indigenous Lands represents almost 50% of the total area of the legal Amazon, in this period, the percentages of deforestation in these protected areas are less than 13.5% (except for the years 2009, 2018, 2019 and 2020).

Protected areas thus have a fundamental role in the conservation of forests and therefore in the conservation of biodiversity. Among these, Indigenous Lands show particularly low rates (only about 27% of the total deforested in the two types of protected areas together).

Indigenous lands have historically had low rates of deforestation and fire incidence among the land tenure categories in the region. This is an indication that the allocation of these areas to traditional populations has a positive effect on preservation with benefits that are shared by all Brazilians. In these areas, the balance created by the traditional use of natural resources and the protection of the territory, active or innate, allows the transformation that has taken place to be of low magnitude and ecosystem services to be maintained (Fellows et al. 2021).

According to Fellows et al., of the 330 Indigenous Lands analyzed, only ten of them, or 3%, concentrated 70% of deforestation and 51% of fires in 2020 in this same land category and this was due to illegal activities by external agents.

Despite the importance of protected areas for the conservation of biodiversity, the existence of rural properties with deforestation inserted in the Rural Environmental Registry (CAR) within protected areas has been observed. In 2016, Prodes recorded 1125 km2 of deforestation in Protected Areas (74% of which in properties registered in the CAR). This deforestation was detected even in Protected Areas where the presence of rural properties in their area is not allowed. This is because the national system of CAR (Sicar) does not restrict registration, by the owner, of rural properties in these categories of Protected Areas. The CAR analysis stage by the government must assess these inconsistencies before issuing a certificate of validity of the registration.

Deforestation by states

In 2020, approximately 63% of the Legal Amazon was covered by forests, 2% by the hydrographic network (rivers and lakes), 19% by non-forest native vegetation and 16% by deforested areas in relation to the total area of the region (INPE 2020). The observation of the geographic distribution of the territory's coverage reveals great territorial heterogeneity with greater deforestation in the south and east of the Legal Amazon (see Figure 5-50).

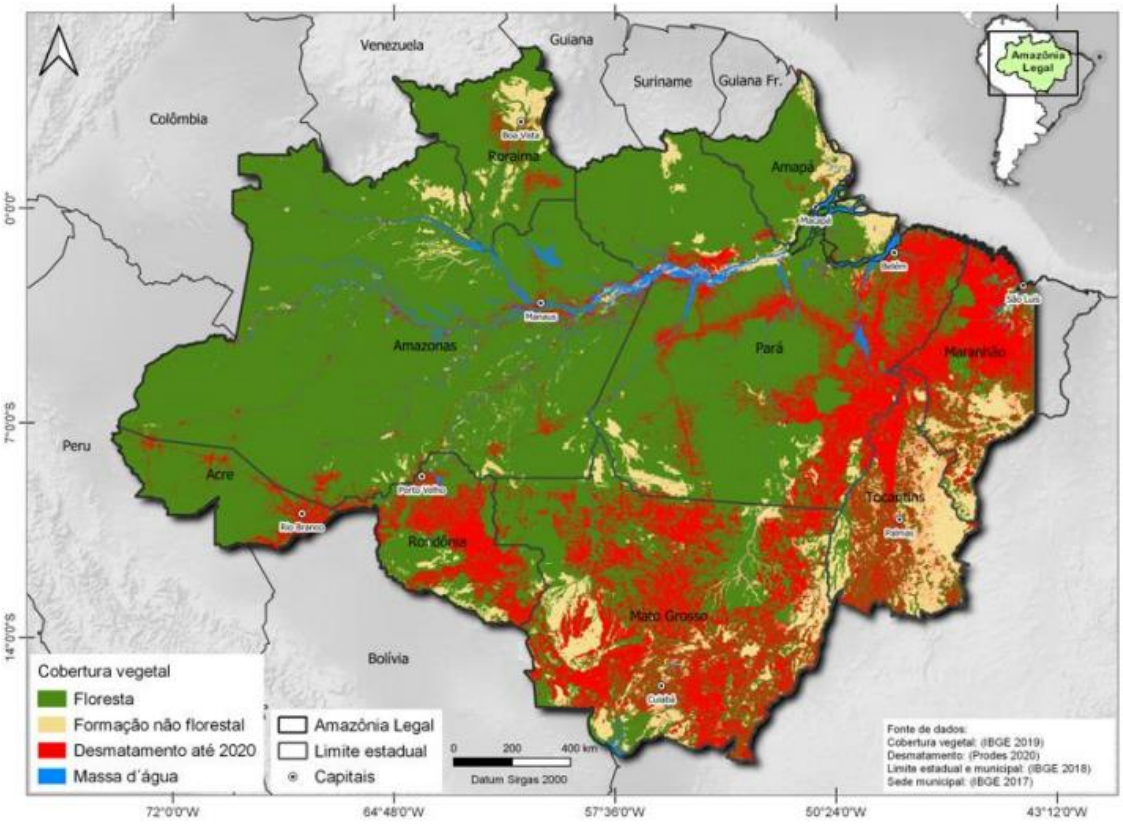


Figure 5-50 Territory Coverage and Deforestation in the Legal Amazon in 2020 (INPE, 2020).

The two states with the largest forest area are Amazonas (1,447,414 km2) and Pará (860,430 km2), followed by Mato Grosso (304,306 km2) (see Figure 5-51). In relative terms, at the state level, the state of Amazonas stands out, with 91.05% of its area covered by forest. Acre comes right next with 85.83% of forest area.

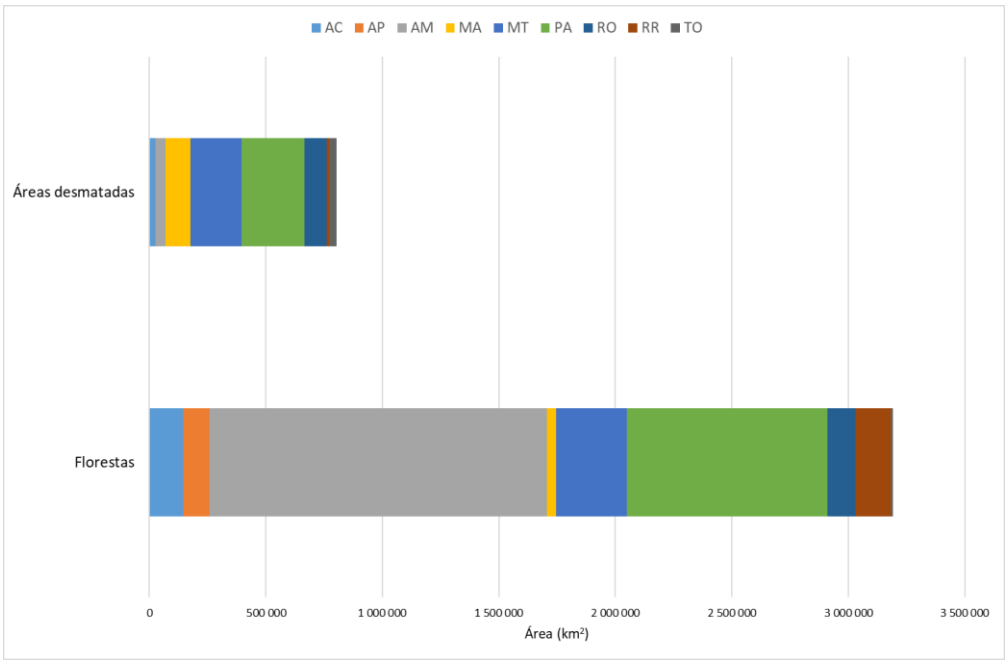


Figure 5-51 Area occupied by forests and deforested areas in each state in the Legal Amazon.

Regarding the deforested area, the states of Pará (271,814 km^2) and Mato Grosso (218,705 km^2) stand out (see Figure 5-51). In relative terms, the states with the greatest deforestation are Maranhão (40.24%) and Rondônia (39.42%).

The PRODES project (www.obt.inpe.br/OBT/assuntos/programas/amazonia/prodes) carries out satellite monitoring of clear-cut deforestation in the Legal Amazon and has produced, since 1988, the annual deforestation rates in the region, which are used by the Brazilian government to establish public policies. The PRODES annual deforestation rate has been used as an indicator for proposing public policies and for evaluating the effectiveness of their implementation.

In the last 16 years (Figure 5-52), it was in 2012 that the minimum amount of deforestation occurred, corresponding to an area of 4,571 km^2 (a value close to the total area of the Federal District). Comparing deforestation in 2020 with that of 2012, there is a very relevant increase in the states of Amazonas, Amapá and Pará, with values three times higher than those recorded about a decade earlier. The only state where a reduction was observed during this period was Tocantins (by half). In 2020, 47% of deforestation was observed in the state of Pará, followed by the states of Mato Grosso (16%), Amazonas (14%) and Roraima (11%).

Historically, the states of Pará and Mato Grosso have shown high rates of deforestation, even in areas of environmental conservation and indigenous lands. Regarding the municipalities that deforested the most between 2019 and 2020, the 10 that deforested the most in the Legal Amazon are: Altamira (PA), São Félix do Xingu (PA), Porto Velho (RO), Lábrea (AM), Balsas (MA), Juara (MT), Novo Progresso (PA), Itaiatuba (PA), Apuí (AM), Pacajá (PA) and Portel (PA) (Figure 5-53).

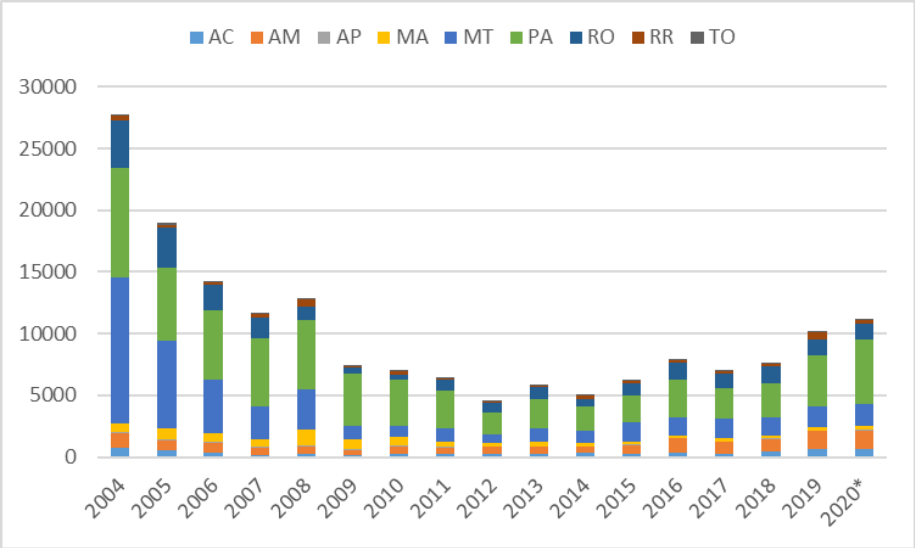


Figure 5-52 Deforestation rate in the Legal Amazon between 2004 and 2020 (Data source: INPE).

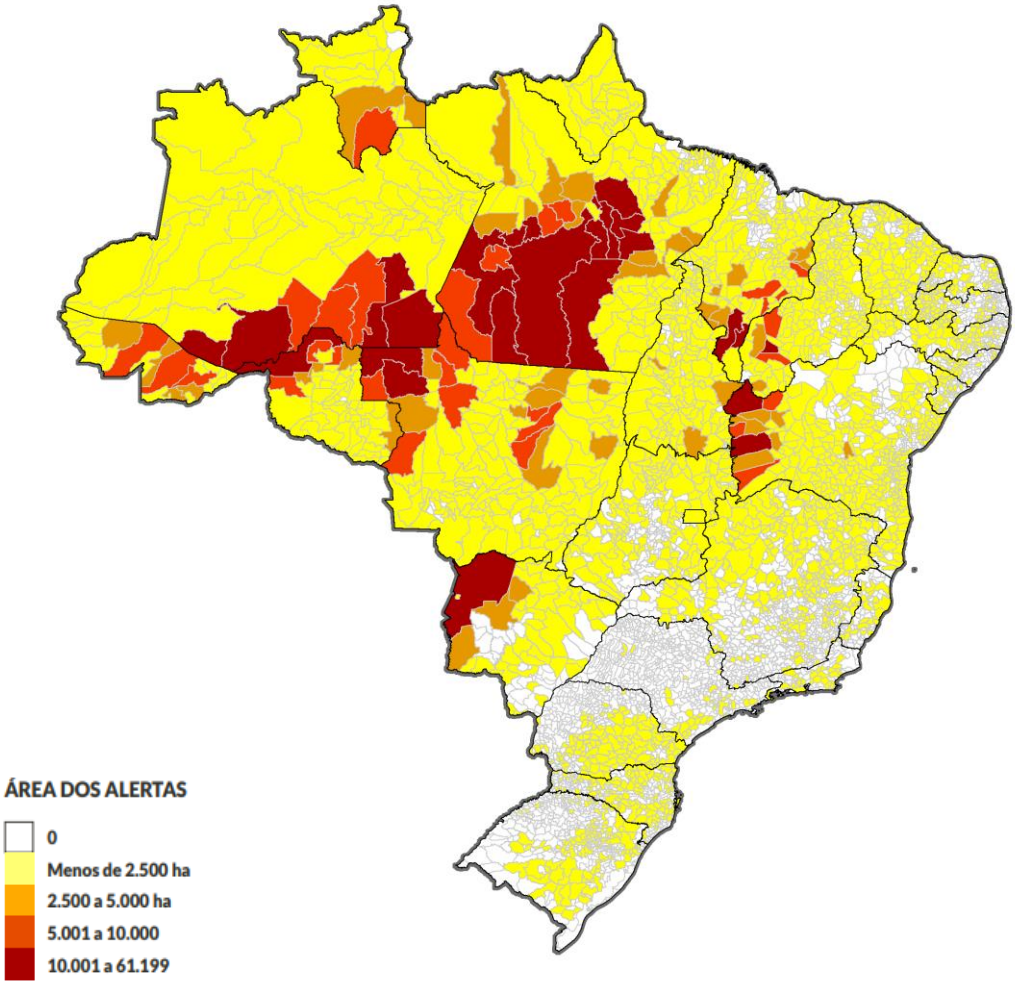


Figure 5-53 Map of Brazilian municipalities with alerts for larger deforested areas in 2020. Source: MAPBIOMAS, 2021.

The areas of Conservation Units (UCs) were also affected by deforestation between the years 2019 and 2020. According to data from MAPBIOMAS (2021) the number of alerts in Conservation Units was 6,420, reaching a

deforested area of 85,892 ha. In the Amazon, the UCs most affected by deforestation were APA Triunfo do Xingu (PA) with 32,141 ha, FLOREX Rio Preto-Jacundá (RO) with 29,940 ha; Flona do Jamanxim (PA) with 8,946 ha, RESEX Jaci Paraná (RO) with 8,023 ha, APA Leandro (Ilha Do Bananal/Cantão) (TO) with 7,035 ha, RESEX Chico Mendes (AC) with 6,448 ha, APA of Tapajós (PA) with 5,770 ha, Flona de Altamira (PA) 5,680 ha, RESEX Guariba-Roosevelt (MT) with 2,929 ha, PES de Mirador (MA) with 2,779 ha and REBIO Nascentes da Serra do Cachimbo (PA) with 2,281 ha (Figure 5-54).

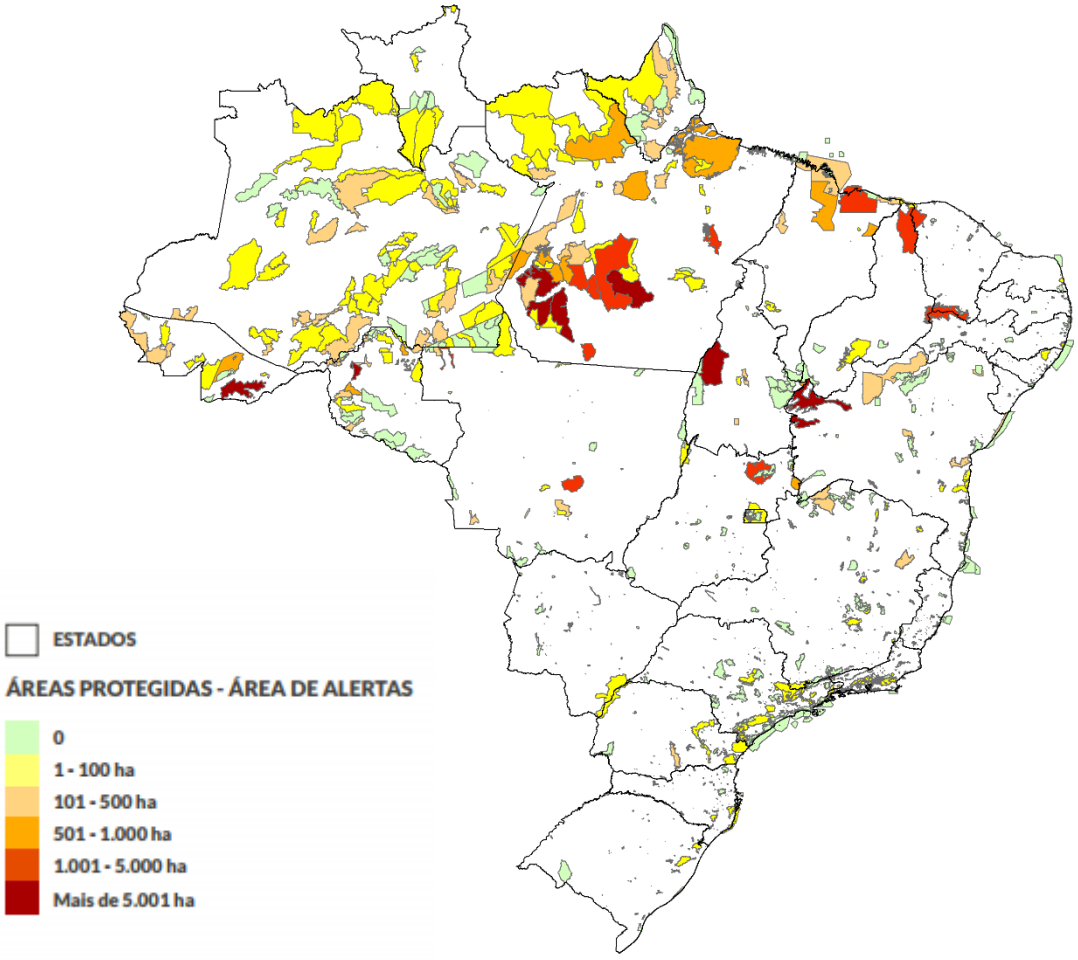


Figure 5-54 Map of the largest deforested areas in protected areas in 2020 Source: MAPBIOMAS, 2021.

The deforestation process in Indigenous Lands (TI) took place predominantly in the territories of the states of Pará, Amazonas and Mato Grosso. However, large areas of deforestation were detected in the south-central region of the state of Pará, north of the Amazon in the border region, between the states of Roraima, Amazonas and Pará, in addition to reserves in the west of the state of Amazonas. The TIs most affected by deforestation were TI Apyterewa (PA) with 7,430 ha; TI Ituna/Itatá (PA) with 3,563 ha, TI Trincheira/Bacajá (PA) with 3,096 ha; TI Cachoeira Seca do Iriri (PA) with 2,805 ha; TI Kayapó (PA) with 1,821 ha; TI Mundurucu (PA) with 1,431 ha; TI Yanomami (AM / RR) with 797 ha; TI Kanela/Memortumré (MA) with 668 ha; TI Piripkura (MT) with 567 ha and TI Kayabi (MT) with 528 ha deforested (Figure 5-55).

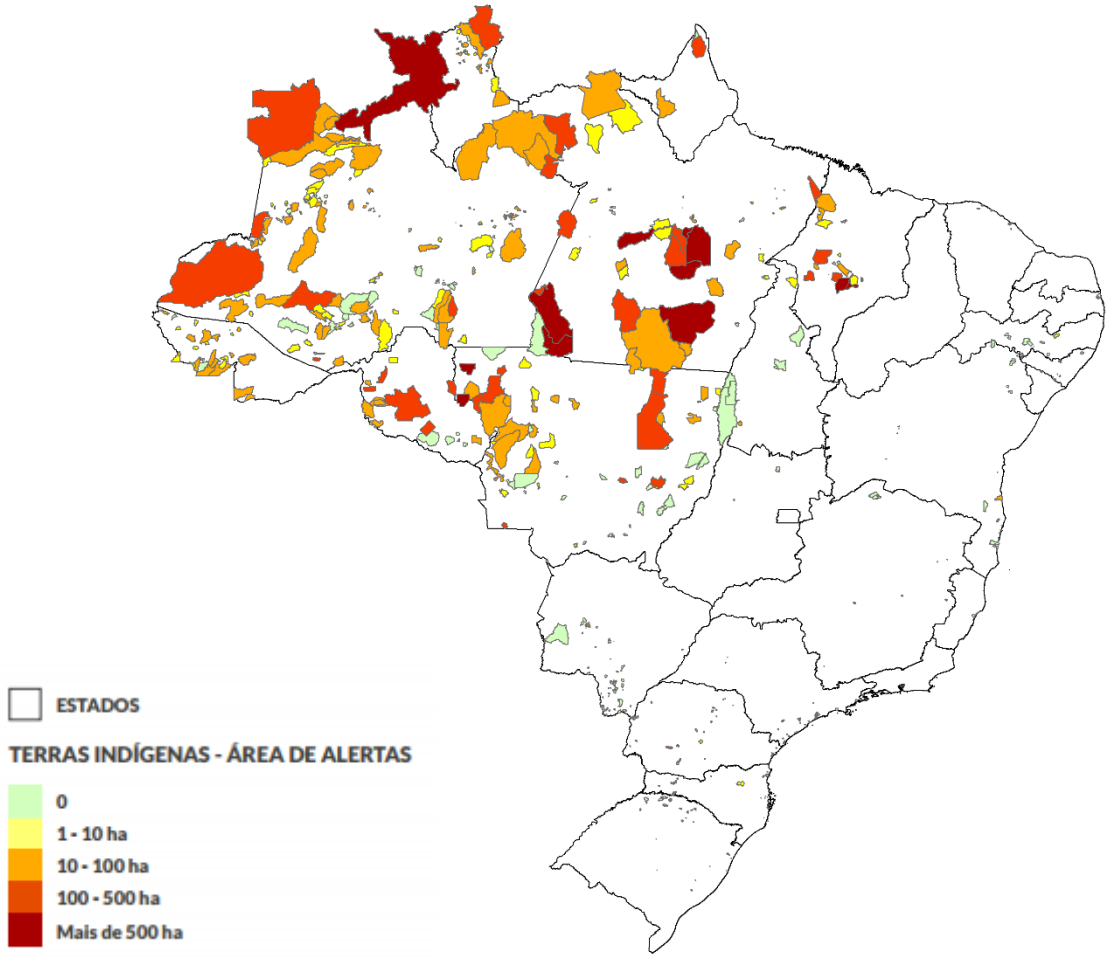


Figure 5-55 Map of the largest deforested areas in indigenous lands in 2020. Source: MAPBIOMAS, 2021.

As áreas de assentamento na Amazônia Legal também foram afetadas pelo desmatamento da floresta em todos os estados, chegando a 214.955 ha, sendo o assentamento rural PA do Rio Juma no município de Apuí no estado do Amazonas, o assentamento onde correu pelo segundo ano consecutivo o maior desmatamento. Os assentamentos onde ocorreram os maiores desmatamentos foram o Projeto de Assentamento (PAs) Rio Juma (AM) com 15.508 ha, RESEX Rio Jaci-Parana (RO) com 8.024 ha, PDS Liberdade (PA) com 7.205 ha, Reserva Chico Mendes (AC) com 6.385 ha, Projeto de Assentamento Familiar (PAF) Jequitibá (RO) com 5.759 ha, PAs Monte (AM) com 3.547 ha, Projeto de Desenvolvimento Sustentável (PDS) Terra Nossa (PA) 2.880 ha, PAs Surubim (PA) com 2.771 ha, Projeto de Assentamento Extrativista (PAE) Antimary (AC/AM) com 2.970 ha e PAs Juari (RR) com 2.685 ha desmatados (Figure 5-56 Map of the largest deforested areas in rural settlements in 2020. Source: MAPBIOMAS, 2021.

). A inclusão de RESEX e outras Unidades de Conservação de Uso Sustentável como áreas de asssentamento, decorre do advento da Portaria Interministerial MDA/MMA Nº 13/2002 que permitiu ao INCRA "... reconhecer as populações extrativistas tradicionais das RESEX como beneficiárias do PNRA (programa nacional de reforma agrária), obedecidos os procedimentos operacionais adotados pelo INCRA e IBAMA".

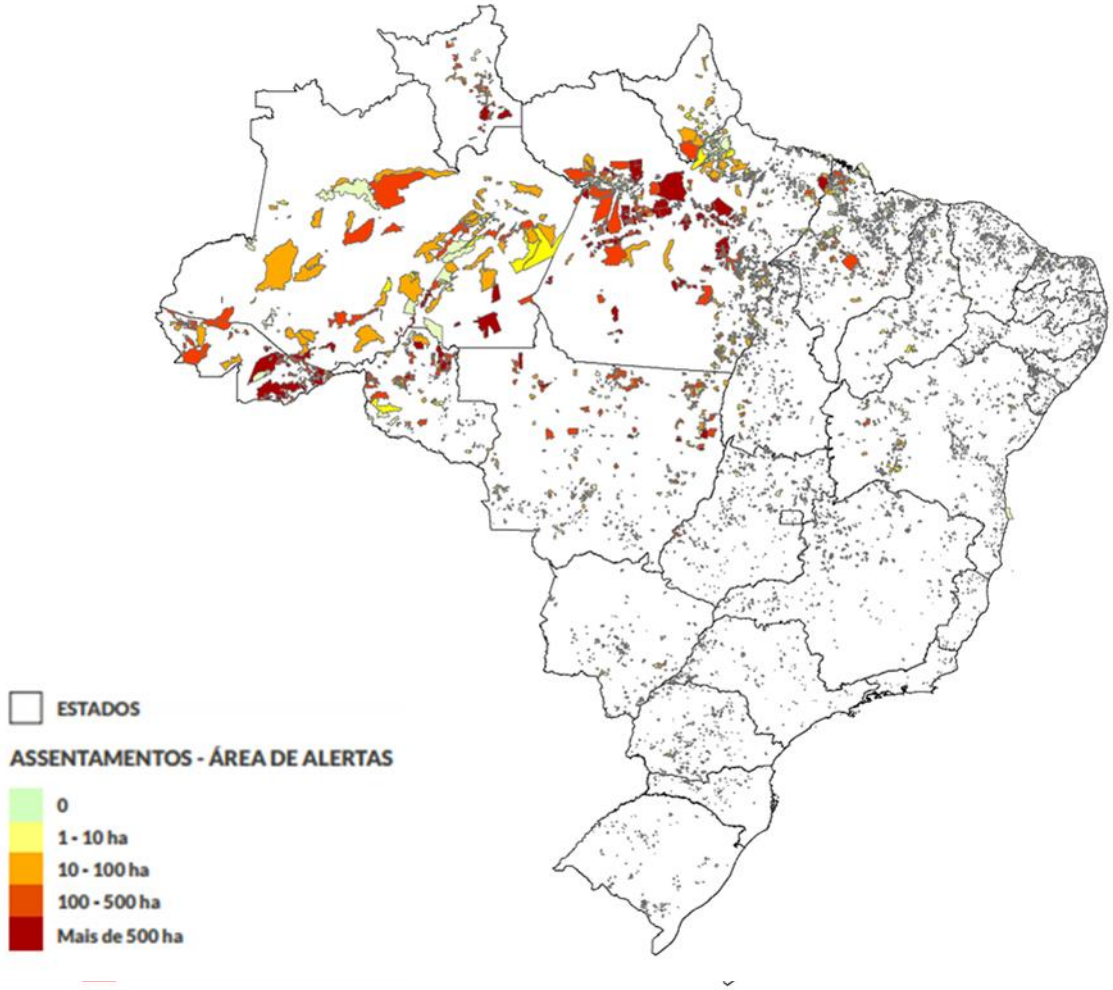


Figure 5-56 Map of the largest deforested areas in rural settlements in 2020. Source: MAPBIOMAS, 2021.

In Quilombola Remnant Lands, deforestation occurred to a lesser degree when compared to UCs, Tis and settlement areas, with Para and Maranhão being the states that had more quilombola territories deforested in 2020. Figure 5-57 shows the territories with the largest deforested area in the Legal Amazon. The territory of Alto Trombetas II in the state of Pará was the quilombola territory that had the largest area deforested in 2020, being three times larger than the territory of Bailique Beira, Bailinque Centro, Poção (PA) together that form the second largest extension in deforested quilombola lands.

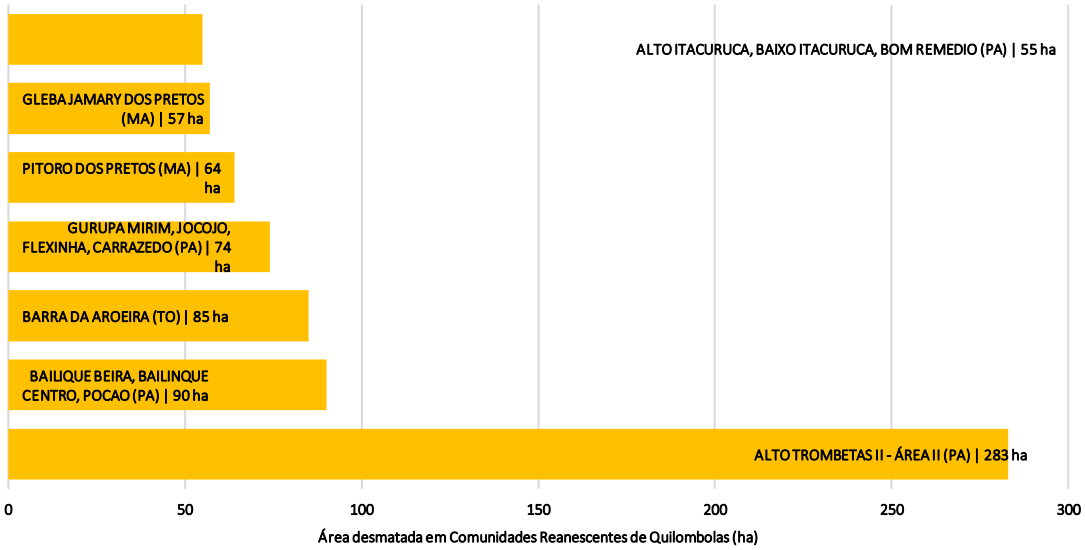


Figure 5-57 Largest deforested areas of Quilombola Remnant lands in the Legal Amazon states in 2020. Source:MAPBIOMAS, 2021.

Deforestation by biomes

The first Annual Deforestation Report (MapBiomas, 2020) produced in Brazil was published in 2020 and covers all Brazilian biomes. This study uses the alerts generated by DETER (INPE's Deforestation Detection System in Real Time, in the Amazon and Cerrado biomes), SAD (Imazon's Deforestation Alert System, in the Amazon) and GLAD (Global Land Analysis and Discovery from the University of Maryland, for the other biomes) to locate deforestation hotspots in daily high spatial resolution (3 m) satellite imagery.

In total 12,187 km^2 of deforestation were identified throughout the Brazilian territory, where 63% of the area is in the Amazon biome, with a total area of 7,700 km^2. The Cerrado biome appears next with 33.5% of the area, totaling 4086 km^2, followed by the Caatinga biome which presents a much lower value with only 121 km^2. More recently (Dec.28.2020)[95], the Ministry of Science, Technology and Innovation (MCTI) released deforestation data in the Cerrado biome for the year 2020, which totaled 7,340 km^2 corresponding to the period from August 2019 to July 2020. This value is higher than that reported by MapBiomas and represents an increase of 13% compared to 2019, the last period disclosed.

In the Cerrado, the concern with the advance of deforestation remains in the northern portion of the biome, where the largest remaining fragments of natural vegetation are concentrated (INPE, 2020). The most deforested areas in 2019 occurred especially in the region known as Matopiba (agricultural frontier of the Cerrado biome comprising the states of Maranhão, Tocantins, Piauí and Bahia) (Figure 5-58).

[95] http://www.inpe.br/noticias/noticia.php?Cod_Noticia=5643

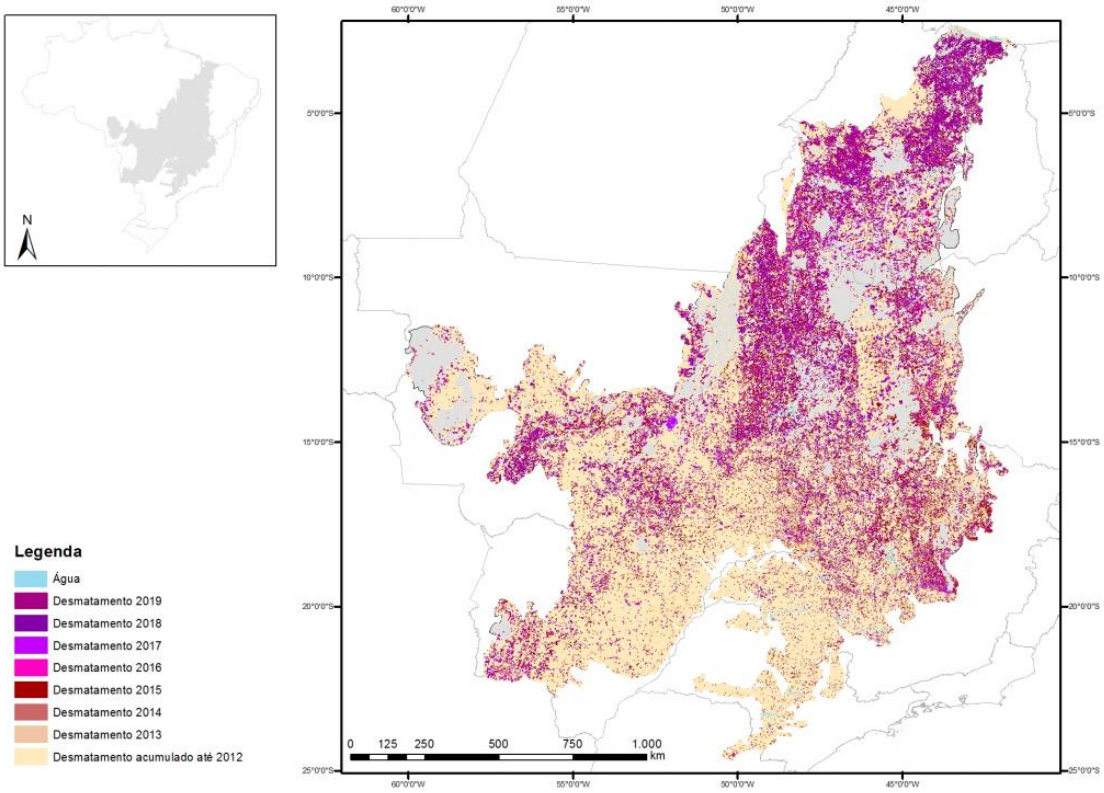


Figure 5-58 Deforestation map prepared by the MMA based on data from the PRODES project for the Cerrado Biome (PRODES Cerrado/INPE, 2019).

It should be noted, however, that the deforestation observed for the Cerrado was 6,484 km2 in 2019, which remained below 2018, when a loss of 6,657km² of native vegetation was recorded (Prodes Cerrado/INPE). These data reveal that the 40% reduction target in relation to the average for the years 1999 to 2008 - stipulated by the National Policy on Climate Change (PNMC) - was surpassed for the Cerrado biome.

5.5.3 Deforestation in Neighboring Countries

The Brazilian Legal Amazon borders 7 countries: French Guiana, Suriname, Guyana, Venezuela, Colombia, Peru and Bolivia. For its part, the hydrographic basin of the Amazon River covers the following countries: Guyana, Venezuela, Colombia, Ecuador, Peru and Bolivia. Deforestation processes occur on a large scale in several of these countries. However, the observation of the geographic distribution of deforestation reveals in several cases (see Figure 5-59) that they are autonomous processes without international geographic continuity. Regarding Brazil, it is worth highlighting the deforestation processes that occur in Peru and Bolivia, which reveal geographic contiguity with similar processes in Brazil (Finer and Mamani, 2020). It is therefore interesting to describe the contexts of deforestation in the Peruvian and Bolivian Amazon.

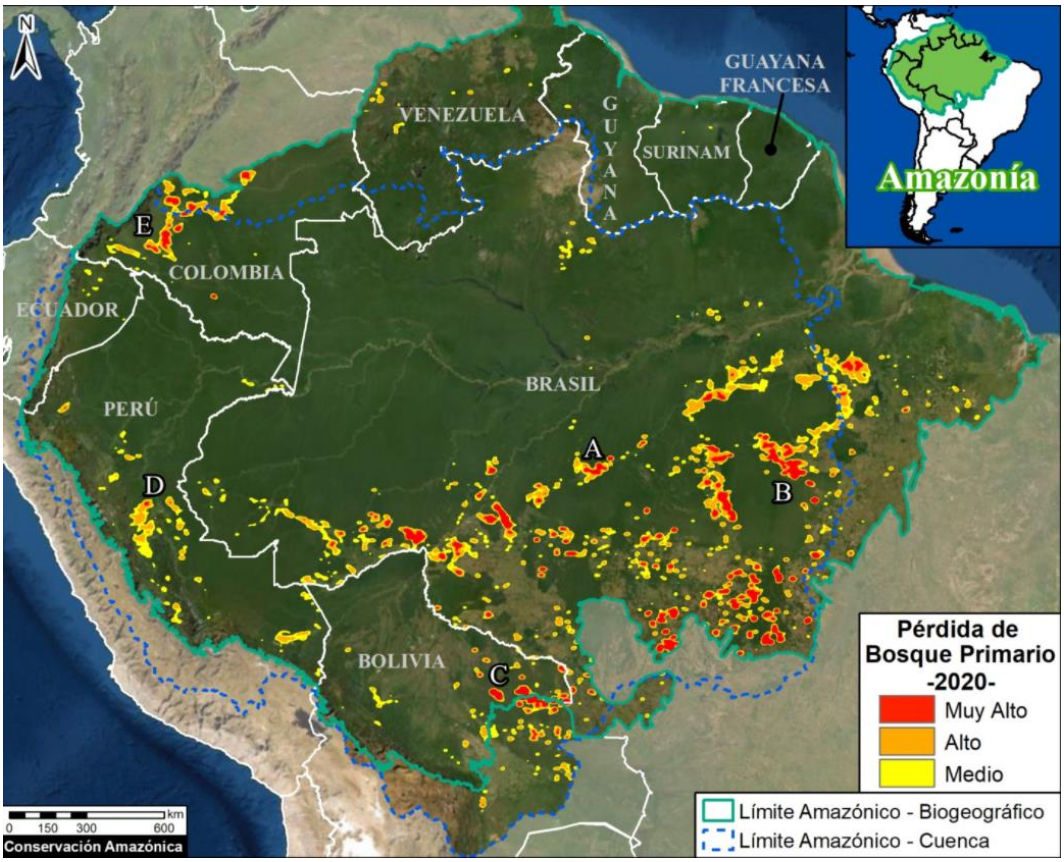


Figure 5-59 Loss of primary forest in the Amazon in 2020 (Finer and Mamani, 2020).

Perú

With the fourth largest area of rainforest in the world, Peru occupies an important place on the international REDD+ landscape. The country's more than 70 million hectares of forest, covering 60% of the national territory, are responsible for around 70% of this country's GHG emissions. Although Peru has experienced relatively low rates of forest loss overall, there is strong geographic variability, with deforestation levels reaching rates above 18% in parts of the Amazon region.

Deforestation in the Peruvian Amazon is estimated to occur at a rate of approximately 120,000 hectares per year, having generated a cumulative loss of 2,433,314 hectares of Amazonian rainforests in the 2001-2019 period (Platform GEOBOSQUES). This change in land use accounts for about 45% of the country's GHG (MinAmb, 2021).

The activities that generate deforestation - most of which occur in the Amazon - are the land colonization of small farmers, cattle raising, large-scale commercial agribusiness (palm oil, soy, biofuels), illegal logging and informal gold mining as well as oil and gas exploration (Hall, 2012).

Over the past 20 years, the pace of deforestation has increased as the Peruvian Amazon opens up to intensive energy infrastructure development. Currently, oil and gas concessions cover two-fifths of the Peruvian Amazon (Reaney, 2011). The expansion of transport links will aggravate this pressure, especially the construction of important roads such as the Interoceanic South Highway that connects the Brazilian Amazon to Peruvian ports for a total length of 2,600 km (Velaverde, 2010).

Since January 2021, Peru has had a National Agricultural Area Map (Vale Costa e Miner, 2021), prepared with high-resolution satellite technology, and published by the Ministry of Agrarian Development and Irrigation (MIDAGRI). The use of this map allowed us to estimate that, in 2018, 43% (4.9 million hectares) of the agricultural coverage of Peru was in the Amazon basin. Of these agricultural areas in the Amazon, more than 1.1 million hectares (24%) come from forests lost between 2001 and 2017 (indicated in red in Figure 5-60). Expressed in another way, more than half (56%) of forest loss in the Peruvian Amazon between 2001 and 2017

corresponds to agricultural area in 2018. The same Figure shows, in black, another recent forest loss not related to agriculture. It can be seen that a large part corresponds to gold mining (southeast Peru) and forest roads.

In short, and from the observation of this Figure, it can be concluded that the large areas deforested in recent decades are in central Peru, far from the border with Brazil. However, it is worth noting some permeation between the deforestation processes in Brazil and Peru in the following regions:

- In the state of Amazonas, in the Brazil-Peru-Colombia triple border area along the banks of the Amazon and Javari rivers.
- In the state of Acre, in the Alto Rio Purus region, along the Purus River.
- Also, in the state of Acre (South), in the triple border Brazil-Peru-Bolivia area, near the Assis Brasil town. Here, deforestation takes place along the BR-317 that extends beyond the Peruvian border on the PE-30C (Corridor Puerto Maldonado – Iñapari).

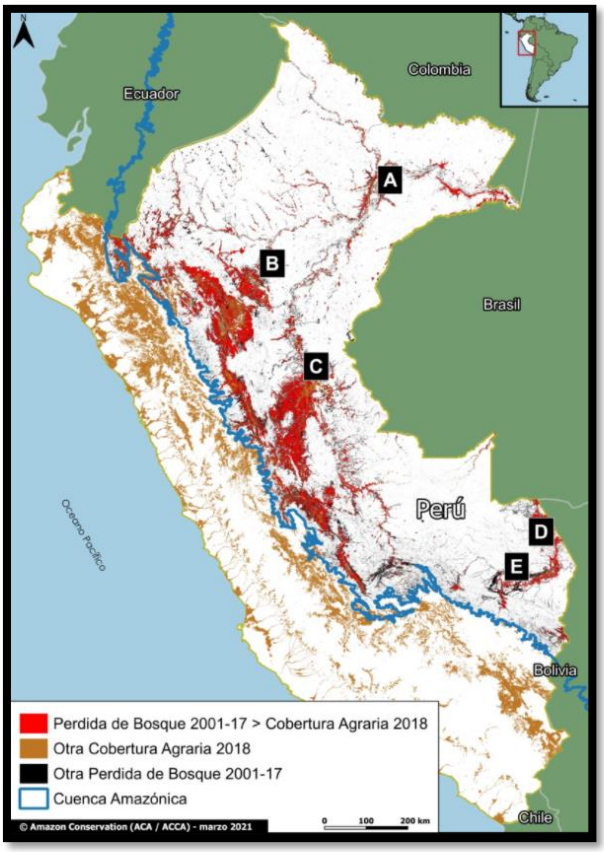


Figure 5-60 Deforestation of the Amazon rainforest in Peru (Source: Vale Costa and Miner, 2021).

In 2003, Peru already had a National Strategy for Climate Change; one of the resulting policies was the National Strategy for Forests and Climate Change (ENBCC), approved in June 2016 by means of a supreme decree. In this context, Peru has a REDD+ action plan or strategy, with the UNFCCC focal point for REDD+ in Peru being the Programa Bosques, which is under the control of the General Directorate of Climate Change, Desertification and Hydrological Resources of MINAM (Ordonio, 2018).

Bolívia

In Bolivia, forests play a key climate role, as trees cover 53% of the country, two-thirds of which is primary forest. Forest loss and degradation contribute nearly 80% of Bolivia's GHG emissions, probably the largest

proportion in Latin America. The destruction is concentrated in the Amazon, in transitional areas, in the dry forests of Chiquitano, in the sub-Andean and Chaco regions. As in other countries in the region, this situation is due to the expansion of commercial farms and lowland agriculture, as well as illegal logging (Hall, 2012).

The border between Bolivia and Brazil extends from the Amazon rainforest in Assis Brasil, in Acre, to Corumbá, in the Pantanal biome in Mato Grosso do Sul and totals 3,400 km. This border covers the Bolivian Departments (from North to South) of Pando, El Bení and Santa Cruz. The biome present in the borders covered by the Departments of Pando and El Bení fully occupy the Amazon biome. The evolution of deforestation in these Departments is summarized in Table 5-52, revealing the existence of greater deforestation pressure from the north to the south of the country.

Table 5-52 Deforestation data between 2002 and 2020 in Bolivian departments bordering Brazil (Source:www.globalforestwatch.org).

Bolivian Department	Lost rainforest area (ha)	Decrease in the total area of primary rainforest (%)
Pando	180,000	-3.1%
El Bení	655,000	-6.9%
Santa Cruz	1,840,000	-12%

The satellite photography (extracted from Google Earth) represented in Figure 5-61 reveals a stark contrast between the deforestation processes that occur in the southern region of the state of Acre and the situation in the Department of Pando, Bolivia. There is some penetration of deforestation in Bolivian territory in the region of Acre, south of Brasiléia - Cobija and south of Rio Branco, near Capixaba. In the north of the state of Rondônia there is a similar process between Guajara-Mirim (BR) and Guayaremerin (BO) following roads BO-8 and BO-9.

In general, the border between the two countries seems to act as a barrier to deforestation processes.

Figure 5-61 Satellite image (Google Earth) of the border between Bolivia (Department of Pando) and Brazil (state ofAcre).

Bolivia is a very suitable country to incorporate REDD+ initiatives as an incentive to control deforestation and promote sustainable development. Hall (2012) states that Bolivia has several years of experience with PES schemes on which it could draw when designing its national REDD+ program. However, it is noteworthy that Bolivia was the only country in Cancún to oppose market mechanisms for REDD+ financing, maintaining the

position that industrialized countries should bear the financial burden, providing compensation only through donors.

In August 2012, the Bolivian government presented an alternative proposal to the UNFCCC entitled "Proposal for the Development of the Joint Mitigation and Adaptation Mechanism for the Integral and Sustainable Management of Forests"[96]. The proposal presents several processes to be developed, including: Adequate institutional conditions that guarantee secure and clear property rights to forest owners; Land management approaches dealing with zoning, legal regulation and land use planning; Coordination of common goals between public and private actors; Articulation of forest and agriculture within the visions of landscape management to promote optimal land use; and so on.

5.6 Climate Change

5.6.1 CO_2 emissions in Amazon

Estimates of CO_{2e} emissions considering the 9 states that make up the Legal Amazon, obtained from the Estimate System for Emissions and Removals of Greenhouse Gases[97] (de Azevedo et al., 2018), show that the peak of emissions has been reached in 2003, followed by a period of significant reduction of emissions until reaching a minimum value in 2010 (Figure 5-62). In the last 5 years there has been an increase of 40%. The "Land Use Change and Forestry" sector is the one that has the most weight in CO2e emissions in the period analyzed, it is also the one that most contributed to this increase, with a growth of almost 50% from 2014 to 2019.

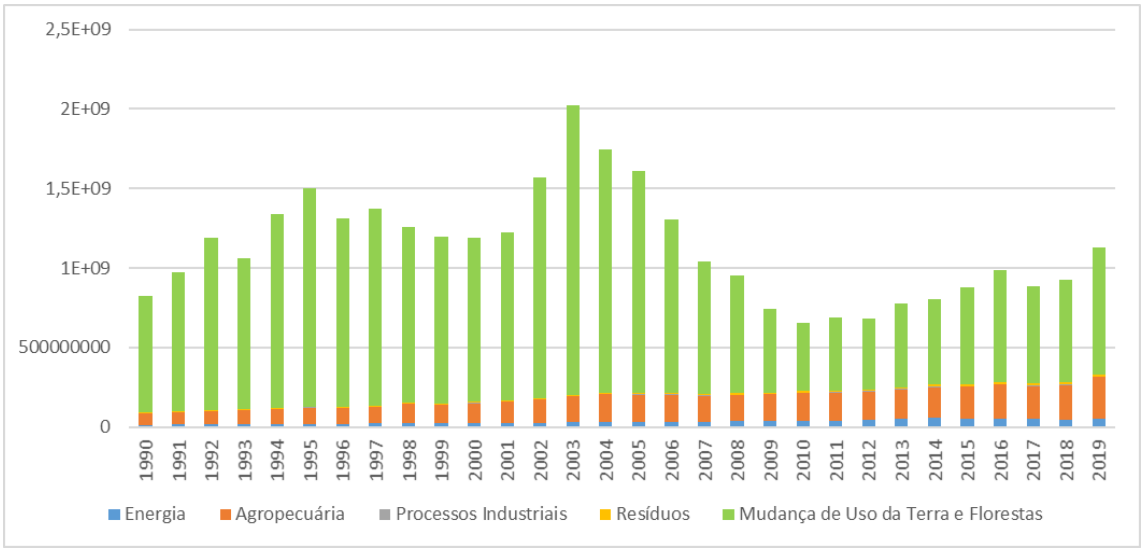


Figure 5-62 CO_{2e} emissions for the 9 states that make up the Legal Amazon. Source: SEEG, http://plataforma.seeg.eco.br/total_emission.

Figure 5-63 shows the estimate of CO_2 emissions resulting from changes in land and forest use for the 9 states in the Legal Amazon. It is observed that the states that contribute the most to emissions are Pará, Mato Grosso, Amazonas and Roraima.

[96] http://redd-monitor.org/wp-content/uploads/2012/10/JOINT-MITIGATION-2.pdf
[97] SEEG; http://plataforma.seeg.eco.br

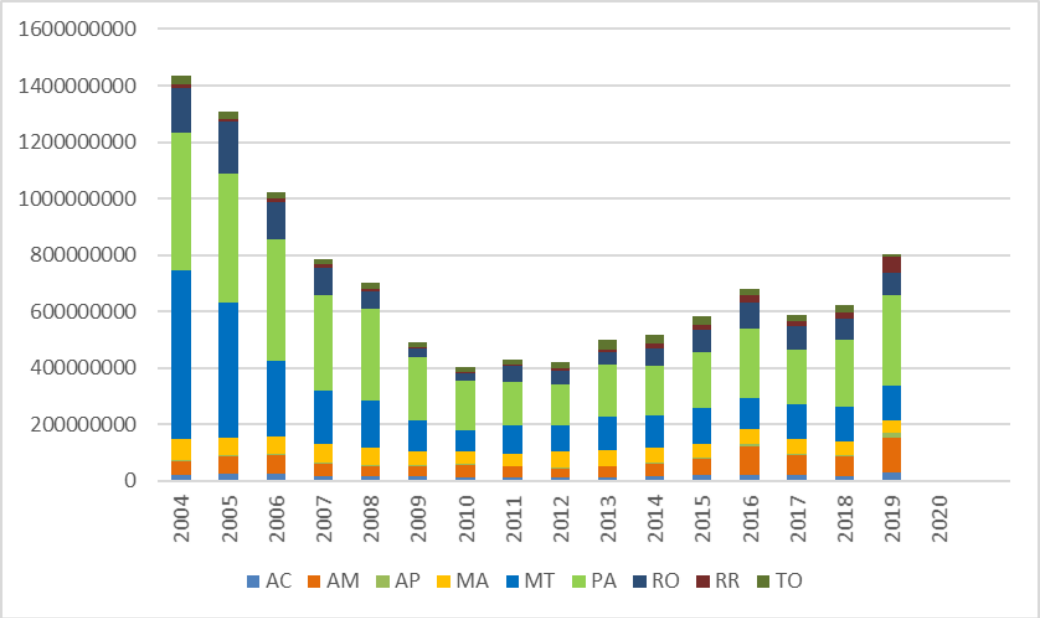


Figure 5-63 Estimate of annual emissions of CO_{2e} (t) resulting from changes in land use - SEEG - System for EstimatingEmissions and Removal of Greenhouse Gases, Climate Observatory, accessed on 29.04.2021 - http://seeg .eco.br.

In order to assess the impact of deforestation in each state in the last 5-year period (2014-2019), Figure 5-64 shows the ratio of CO_2 emissions estimated in the interval of this period (2019/2014) (SEEG). It appears that only in two states – Mato Grosso and Tocantins – there was a reduction in the deforested area (ratio <1). In all other states there was, in this period, an increase in CO_2 emissions resulting from changes in land use, particularly critical in the states of Amapá, Rondônia and Amazonas, where CO_2 emissions tripled in this period.

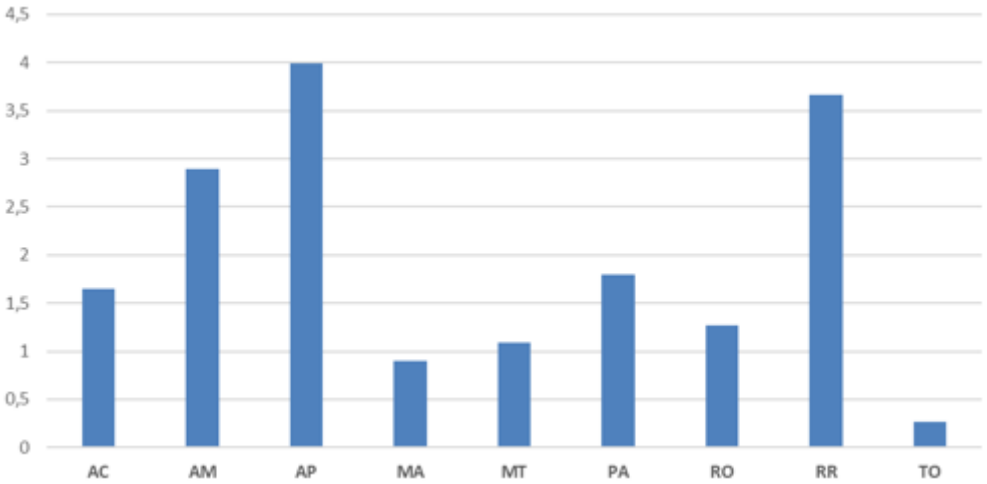


Figure 5-64 Comparison of CO_2 emissions due to land use change (deforestation) between 2019 and 2014 (Data source:SEEG).

5.6.2. Future Climate

In the Amazon, the observed warming from 1949 to 2017 ranges from 0.6 to 0.7°C, according to various sources of temperature data (Marengo and Souza Jr., 2018). Although there are some systematic differences, all sources point to greater warming in recent decades, with 2017 being the warmest year since the mid-20th century. (Figure 5-65).

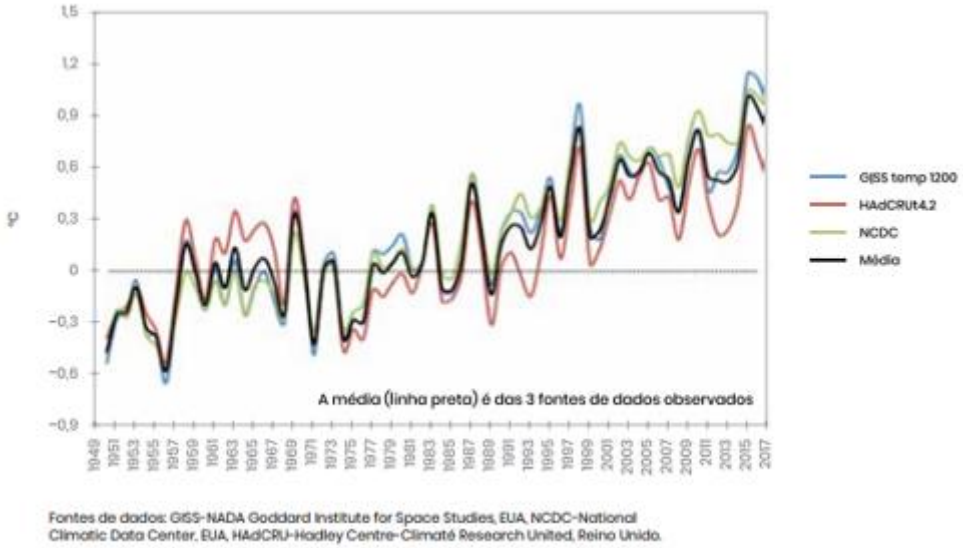


Figure 5-65 Observed temperature change from 1961-1990 obtained from three data sources for the Amazon in theperiod 1949 to 2017 (Marengo and Souza Jr., 2018).

Fluvial floods and droughts, to a greater or lesser extent, are natural phenomena in the dynamics of rivers in the Amazon and, due to the large extension of the Amazon basin, precipitation rates and the small slope of the beds of its main rivers, they can be long lasting (Alves, 2015, cited by Vasconcelos, 2020).

The extreme events are linked to the El Niño and La Niña weather events that correspond to the warming and cooling of the waters of the Pacific Ocean, respectively, generating an increase or reduction in precipitation, as well as changes in river discharge and levels and the complexity of the hydrological system of the Amazon basin (Zeng et al., 2008).

Deforestation reduces the forest's water retention capacity and evapotranspiration, contributing to the increase in river volume, aggravating floods. On the other hand, because of deforestation, there was an increase in days without rain between the periods 1961-1990 and 1991-2018, a situation that aggravates the occurrence of slash-burning (Vasconcelos, 2020). The effects of global warming are already perceived by riverine populations, through the greater frequency of extreme river events and other events close to normality thresholds that end up generating river environmental disasters, both flooding and ebb, which enhance the existing socio-environmental vulnerabilities (Guimarães et al., 2019).

The GHG emission scenarios used by IPCC AR5 are called RCPs (Representive Concentration Pathways). The more optimistic RCP2.6 represents a scenario where the emission of greenhouse gases is stabilized from 2050 onwards and the RCP8.5 scenario, which is more grievous, considers increasing emissions at the end of the 21st century. In Figure 5-66, warming in Amazonia could reach up to 6°C by the end of the 21st century in RCP8.5 and rainfall could be reduced by as much as 15-20% in central and eastern Amazonia. It should be noted that RCP scenarios do not include deforestation or urbanization rates in their configuration.

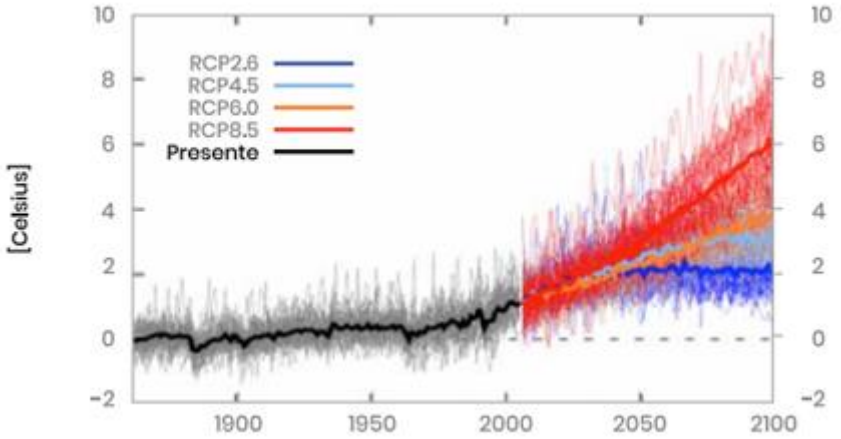


Figure 5-66 Temperature change projections up to 2100 for the various IPCC AR5 emission scenarios for the Amazon.(Marengo and Souza Jr., 2018).

The climate change scenarios for the Amazon, projected by complex climate models and presented by the IPCC, point to an increase in the average air temperature projected by the end of the 21st century well above 4ºC and a reduction in rainfall of up to 40% in the Amazon (Figure 5-67). This change in air temperature has the potential to generate major imbalances in ecosystems vital to humanity's survival.

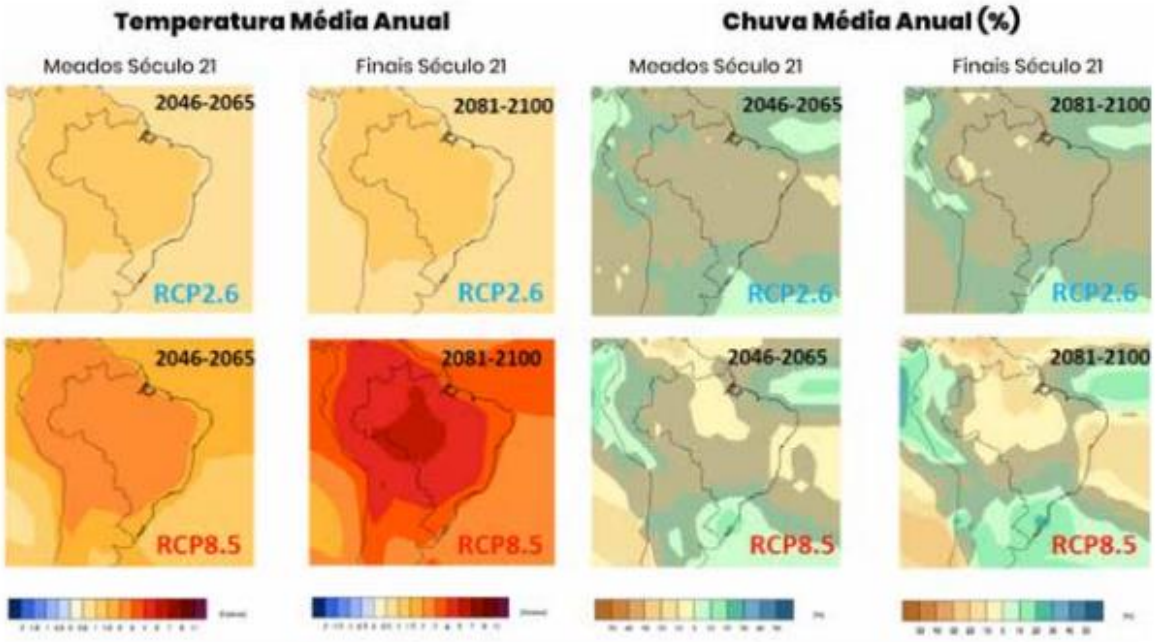


Figure 5-67 Projections of temperature changes and rainfall in tropical South America produced by the IPCC AR5 modelset for 2046-2065 and 2081-2100 with low emission (RCP2.6) and high emission (RCP8) scenarios, for the period 1981-2015 (Marengo and Souza Jr., 2018).

Brêda et al. (2020) evaluated changes in the water balance and discharge of rivers in South America, until the end of the century and considering scenarios RCP4.5 and RCP8.5 and an ensemble of 25 global models and observed for the Amazonas Basin an increase in temperature, a reduction in precipitation and runoff, and an increase in evapotranspiration and the aridity index (Figure 5-68).

This study further suggests that in the RCP8.5 scenario, the Orinoco, Tocantins and Madeira basins will likely show at least a moderate reduction in flow (10-20%), while in the Tapajós, Xingu and Purus basins, water resources should be highly impacted (over 29% discharge reduction at least)

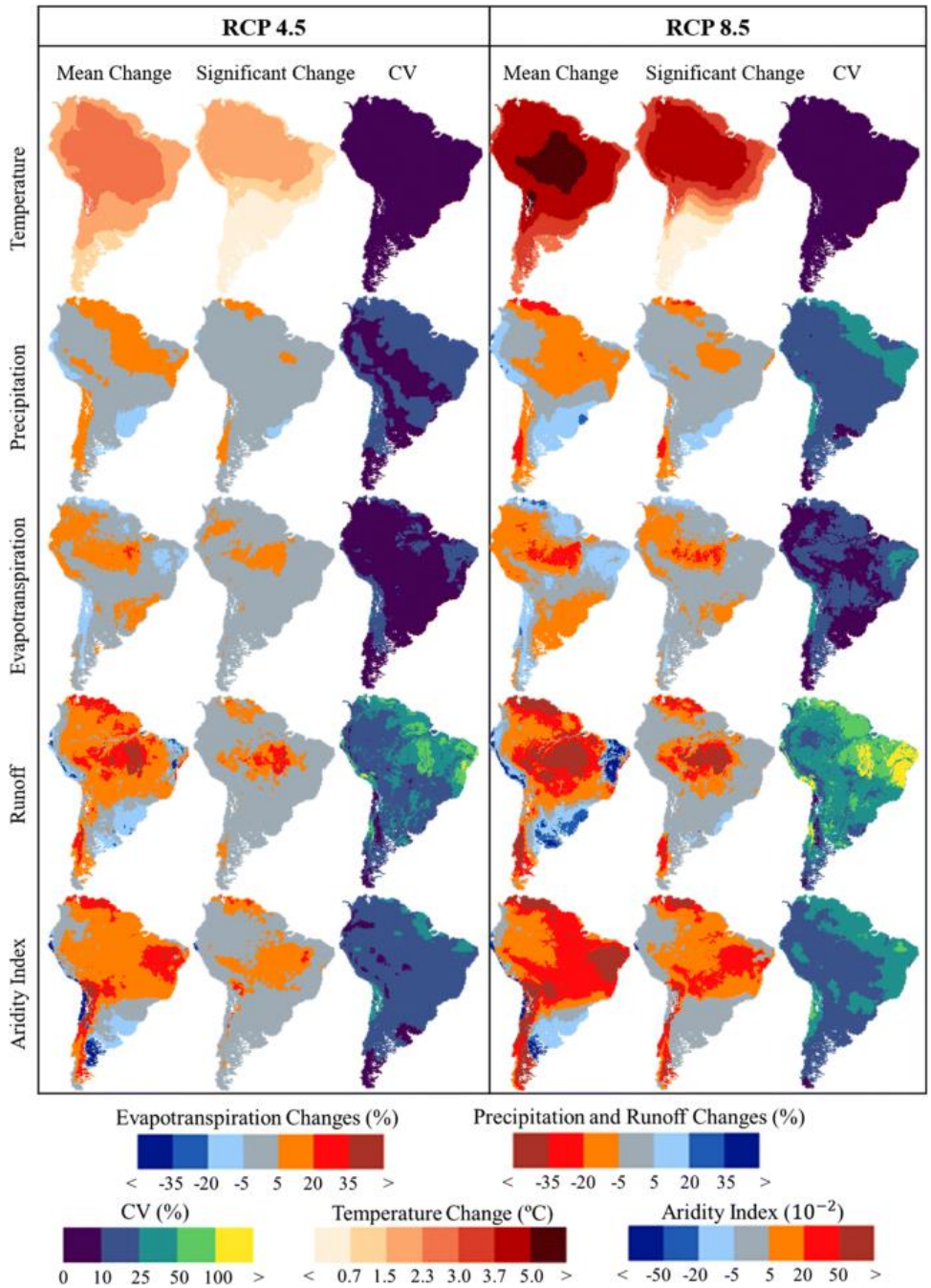


Figure 5-68 Projected impacts on the components of the water balance in South America (in terms of mean values). Relative (mean and statistically significant) changes in precipitation, evapotranspiration, runoff and absolute changes inthe aridity index and temperature in both scenarios (RCPs 4.5 and 8.5) are presented. The coefficient of variation (CV) is related to the projection set (it is not applicable to temperature because of occasional mean zero values if considering the Celsius scale and higher mean values compared to the standard deviation if using the Kelvin scale) (Brêda et al; 2020).

6. Risks and Environmental and Social Impacts

This chapter includes an assessment of the risks, opportunities and potential environmental and social impacts resulting from the implementation of the various Modalities of the Floresta+ Amazônia Pilot Project. It is considered that the great similarities existing between Modality 1: Conservation and Modality 2: Recovery allow these two Modalities to be treated almost always together. The similarities concern both the objectives of each Modality and the beneficiaries they target. In the case of the analytical dimensions related to Biodiversity and Climate Change, it was decided to carry out a differentiated analysis of these two Modalities.

The chapter begins with a summary of stakeholder perceptions regarding the whole of the Floresta+ Pilot Project. Then, an analysis of the environmental and social effects of each Modality is presented, based on the set of perceptions extracted during the engagement of stakeholders, complemented with an assessment of the effects on each of the analytical dimensions. Finally, a summary of the effects is presented, structured according to the actions necessary for the operationalization of each Modality.

6.1 General Perceptions of Stakeholders

Through the Participatory Workshops, which aimed to identify the potential positive and negative effects of the Project and identify mitigating measures from the perspective of potential beneficiaries and other interest groups, a broad set of 220 positive and negative effects were identified, which corresponds to about 10 observations for each working subgroup (according to the methodology used in the Workshops). This broad set of effects were reviewed in detail as there were similar or very similar consequences that have been identified by different groups.

Figure 6-1 presents an overall assessment of how the perceived effects are distributed by each of the Modalities. This analysis is restricted to comments obtained during participatory workshops with stakeholders. It should be noted that no analysis of the pertinence, adequacy or technical feasibility of the perceptions was carried out.

It is observed that almost a quarter of the effects recognized during the participatory workshops are of a general nature, being applied across all Modalities (23%). Modalities 1 and 2 raised more than a third (37%) of the references throughout the workshops. It should be noted that most of these comments are comprehensive and apply simultaneously to Modality 1 and Modality 2. The effects related to Modality 3 - Communities total 27% of the comments gathered during the workshops. With a smaller number of comments comes Modality 4 – Innovation, with 5% of the comments. It should be noted that 7% of the comments, although considered relevant, focus on issues associated with the external context of Floresta+ Amazônia, and not on effects that can be directly attributed to the Pilot Project.

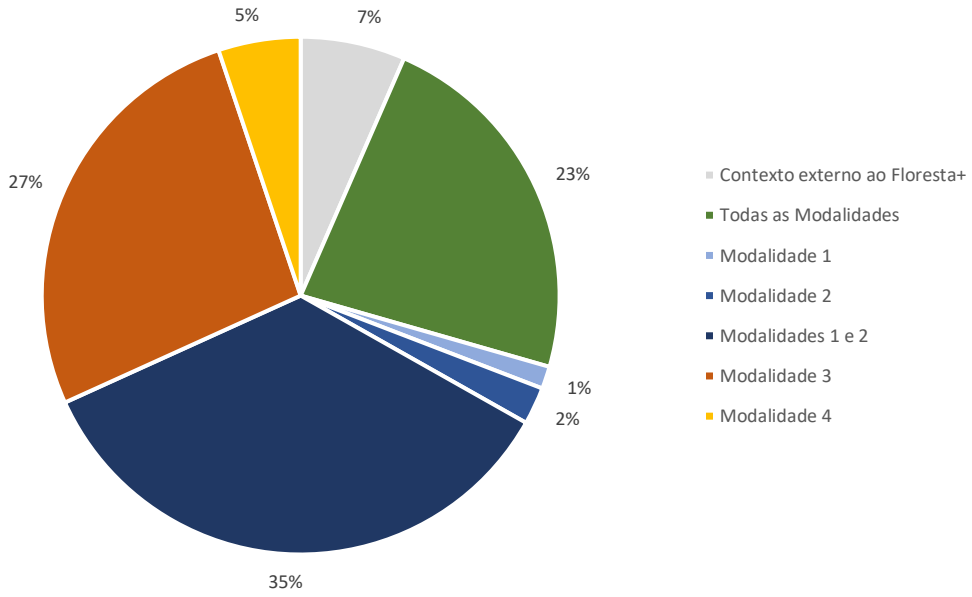


Figure 6-1 Global distribution of the effects of the Floresta+ Amazônia project by the various Modalities.

Based on the audience comments, it is observed that 60% of the effects identified by the participants in the workshops are of a negative nature. The remaining 40% are positive effects. Although there are no reference levels for this negative/positive subdivision, the fact that 40% of the effects identified by the stakeholders are positive demonstrating the great potential benefits associated with the Pilot Project. Experiences from other similar projects reveal that there is a strong predominance of negative comments compared to positive ones from these participatory processes, as there is typically a greater emphasis on identifying the problems that may arise with the implementation of a project, rather than the benefits associated to it. This last fact is confirmed in Figure 6-2, which shows that most comments relating to the external context appear as negative.

Figure 6-2 Distribution of positive and negative effects of the Floresta + Amazônia project across the various Modalities.

The same analysis for the various Modalities of the Floresta+ Amazônia Pilot Project does not reveal great distinctions between the Modalities, showing some balance between positive and negative observations.

It was possible to relate each effect identified with each of the five analytical dimensions adopted in the conceptual evaluation model. This relationship, considering the negative and positive effects, is showed in Figure 6-3. There, three distinct situations are observed:

- For transversal rights there is a clear predominance of negative over positive effects, possibly represented by negative perceptions considering the risks perceived by the workshop participants.
- In the case of the analytical dimensions related to territories and cultures and livelihoods,there is a balance between negative and positive perceptions.
- Finally, there is a greater number of positive observations for biodiversity and climate change.

Figure 6-3 Distribution of positive and negative effects of the Floresta + Amazônia project at the level of the evaluationdimensions.

The Floresta+ Amazônia Pilot Project supports the continued implementation of the Law for the Protection of Native Vegetation by encouraging the conservation and restoration of this vegetation, which, in this context, presents a set of positive effects, most of which are positive impacts.

Regarding the negative effects, it appears that most are 'contextual problems' and there are still risks being highlighted that should be taken care of.

Table 6-1 Positive effects of the Floresta+ Amazônia Pilot Project.

Effect	Floresta+	Description
Positive impact	Strengthening of SISREDD	Strengthening, appreciation and reactivating the SISREDD safeguards system
	Encourages the implementation of LPVN	The mechanism of payment for environmental services will encourage the process of implementation of Law 12,651/2012 (Law for the Protection of Native Vegetation) byincreasing interest on the part of Producers, the Government (at Federal and State levels) as well as the general public.
	Promotes Environmental Services	Promotes and publicizes the importance of environmental services, recognizing that the environmental regularization ofthe property, conservation and recovery of the forest bring benefits. It recognizes those who have historically preserved native forests. Gives greater visibility to monitoring.
	Promotes forest protection	Promotes the maintenance of the standing forest andattention to environmental problems related to deforestation, such as fires.
	Improved quality of life	Promotes an improvement in the quality of life of the benefited families through the enhancement of their economic activities and the increase in available income. It promotes an improvement in the quality of life of indigenouspeoples and traditional peoples and communities, through the implementation of projects that will respond to their needs.
	Contributes to climate stability	Promoting the maintenance of the standing forest will contribute to climate stability both locally and globally.
	Promotes cultural diversity in territories	The Project has the proposal of cultural valorization and social, economic and environmental benefits, generating opportunities, social justice, protection of forests and territories and strengthening of traditional ways of life andcosmovision. It contributes to expanding the guarantees ofrights for indigenous peoples with the support of existing policies in the States.
Opportunity	Promotes sustainable production	The valorization of environmental services, by strengthening agricultural production and the flow of agricultural products, may indirectly promote sustainable production.
	Promotes safety	Promotes forest surveillance and protection and, consequently, safety.
	Strengthening women's movements	By safeguarding the gender equality safeguard policy, the project will contribute to the strengthening of women's rights

The negative effects identified are mostly related to pre-existing context problems, which may hinder the project's success, but which do not constitute negative impacts directly associated with the project. These are context factors, external to the project, that are negative and can negatively impact project implementation. Although they are not direct actions of the project that have negative impacts, it will be essential to consider these contextual problems in the operational management of Floresta+ Amazônia. Otherwise, the objectives intended with the Pilot Project may not be achieved.

It is also worth noting that the stakeholders mentioned four risks that they may happen within the implementation of Floresta+ Amazônia: one of them is related to the continuity of the project. It is not already assured, so there is a risk that, after the end of the Pilot Project, the situation related to deforestation, as well as the socioeconomic conditions, will worsen. Under these conditions, there would be a setback in the results achieved during the duration of the Pilot Project. Another risk, given the current situation, is that it is expected to be difficult to guarantee the participation of women, in other words, the gender equality policy. It is also worth mentioning the general perception of stakeholders regarding the complexity of the process of applying

for the Floresta+ Amazônia, which could impede the participation of some potential beneficiaries. Finally, the increase in land conflicts is highlighted as a risk of the project, as it boosts the interest in receiving payment for environmental services and, in this way, encourages abusive registration and thickens existing problems of land overlapping, illegal appropriation of land and land appropriation without land definition.

Table 6-2 Negative effects of the Floresta+ Amazônia Pilot Project.

Effect	Florest a+	Description
Context problem	Pre-existing discredit	There is widespread discredit in projects
	Lack of young people	The lack of young people in the community interested in staying and developing activities in the rural world, the non-existence of young people in decision-making bodies are problems that affect the success in the implementation/continuity of projects.
	Difficulty accessing the internet and email	Difficulty in accessing the internet is a limiting factor in accessing information about the project and the documentation needed to formulate the application. There areplaces and potential beneficiaries with easier access to the internet, which can lead to spatial differences in the allocation of PES.
	Lack of information	Difficulties in accessing the internet (as an information channel), non-disclosure about access to certain benefits/projects through different information channels, the absence of training, awareness and training processes in the communities hinders knowledge about the PES project. Peoplewith greater access to information and political power can be favored over others.
	Large diversity of beneficiaries	The heterogeneity of the groups may allow some of them to be left out of the selection process, due to lack of timely information, for not having secured territory, etc. Promotion of unequal participation among potential beneficiaries, especially in relation to indigenous peoples and traditional communities.
Risk	Application complexity	The high bureaucratization makes the implementation of projects difficult. There have already been many management plans and projects that, because of bureaucratization, have become difficult to implement.
	Project continuity is not assured	As a Pilot Project dependent on international funds, and similarly to other projects in the past, there is a risk that it will not continue, namely due to the lack of resources and the fact that this type of initiative does not become public policy.
	It is difficult to guarantee the participation of women	Gender inequalities make it difficult to participate in initiatives more effectively
	Increase in land conflicts	The expectation and anticipation of eventual approval of native forest protection projects in disputed areas will trigger retaliatory actions by the occupants and invaders who decide to destroy the vegetation, taking advantage of the weak performance or lack of action of the control bodies. On the other hand, deficient CAR validation mechanisms may encourage illegal land delimitation practices, namely in community territories. Trigger conflicts over resources

6.2 Modalities 1 and 2: Conservation and Recovery

The implementation of the Floresta+ Amazônia Pilot Project, namely through its Modalities 1 and 2, will support the owners or squatters of rural properties through the Payment for Environmental Services and will strengthen and boost the implementation of the Law for the Protection of Native Vegetation in the Legal Amazon. This contribution will be achieved through the conservation of existing native vegetation (Modality 1) and the

recovery of sensitive areas for important ecological processes (Modality 2), in the latter case, permanent preservation areas.

6.2.1 Perceptions

The differences between the effects of Modality 1 and Modality 2 are difficult to distinguish. On the other hand the overall objective of the project, as well as the Modalities in question, no direct negative impacts resulting from the implementation of the project were properly identified. Even if negative effects are observed, namely what exist are 'context problems' and 'risks' associated with the implementation of the project. The 'context problems' are mainly related to the Rural Environmental Registry as an eligibility criterion. Concerns were mentioned regarding the *lack of regularization of the CAR in the states, and the use of the CAR as the only form of proof of execution of the environmental service*.

The positive effects are mostly reflected in positive impacts: the promotion of environmental regularization, the contribution to improving the quality of life of beneficiaries and increased awareness of the importance of environmental issues. Another important factor indicated in the workshops as a positive impact of the project is the incentive to environmental recovery, which, through payment for environmental services, can leverage initiatives on the part of the project's beneficiaries. According to the participants, it will be a stimulating tool to ensure the environmental recovery of ecosystems and restoration of springs, in addition to identifying different ways to ensure environmental preservation, creating mechanisms to mitigate deforestation, directly involving the local population, through the engagement of owners, squatters and entities that support the environmental area.

Finally, most of the people who participated in the Workshops are potential beneficiaries of the Project or its representatives, justifies that perceptions in relation to labor conditions in the territory appear in a positive perspective, as the opportunity for a new source of income for rural workers, owners and possessors, or an opportunity to improve the possibility of rural workers' children to have access to school.

Table 6-3 Positive effects of the Floresta+ Amazônia Pilot Project: Modalities 1 and 2.

Effect	MOD 1+2	Description
Positive impact	Promotes the environmental regularization ofproperties	As environmental regularization is one of the key requirementsfor accessing the project, a direct impact will be the promotionof environmental regularization of properties (advancement ofthe CAR agenda) so that the landowner of the area can access the PES.
	Improvement of the socioeconomic conditionsof family farmers	Compensation for environmental services can provide an alternative source of income for family farmers, improving their socioeconomic condition.
	Promotes the expansion of the Legal Reservearea (Modality 1)	The Floresta+ Pilot Project encourages the expansion of the legal reserve area beyond what is legally required, contributing to strengthen the Native Vegetation Protection Law.
	Encourages environmental recovery (Modality2)	The Floresta+ Pilot Project encourages the environmental recovery of important ecosystems with a focus on permanent preservation areas.
	Promotes environmental awareness ofbeneficiary populations	Entering the PES system contributes to increasing the environmental awareness of the landowners/owners of the area regarding the need/importance of keeping the forest standing.
	Values rural properties that are beingconserved or recovered	The project provides additional income to Pilot Project beneficiaries.
Opportunity	Reduces conflicts among the local population	Favors the construction of common policies bringing together the interests of different groups.
	Promotes family farming	The project strengthens the beneficiaries of the Pilot Project.

Table 6-4 Negative effects of the Floresta+ Amazônia Pilot Project: Modalities 1 and 2.

Effect	MOD1+2	Description
Context problem	CAR: low number of validations	Lack of regularization of the CAR by the States. The CAR analysis process is slow and may vary in time, depending on the conditions in each state. INCRA is without resources and with less capacity to regularize the lands. The use of the CAR as the only way to prove the execution of the environmental service can harm the landowners/owners of the area that actually perform the environmental services.
	CAR: overlap with collective territories	There is a perception that CAR overlapping with collective and settlement areas may occur. There are more CAR numbers than there are farmers.
	CAR: high cost of the registration process	Risk of expanding the opportunity only to those who can afford the CAR. Small landowners/owners of the area must have intermediaries to carry out this process. In case the landowners do not have an email, there is a risk of being in the hands of the person who registered and the email listed there. Illicit schemes related to the registration of beneficiaries, e.g. someone helps the beneficiary to register in exchange for rewards.
	CAR: abuse by large landowners	Use of CAR by large landowners, subdividing the area of their properties among different people for the purpose of validating the CAR by areas of up to 4 fiscal modules and consequently obtaining the PES.
Risk	Unfair distribution of PES	Risk of payment not reaching populations that effectively contribute to forest preservation, that is, there is a risk of payments being diverted for other purposes. SICAR will identify the CAR that have a surplus, which contribute to the preservation of the forest: but it is essential to know who must be paid (CPF – Cadastro de Pessoa Físcal, Individual Fiscal Registration) for that property, and ensure that the bank account belongs to the person.
	PES value is excessively low	There is a risk that the amount paid is not attractive to potential beneficiaries. Recovering (mod 2) is more difficult/expensive than conserving (mod 1). But the PES of the Recovery Modality is lower than that of the Conservation Modality.
	Insufficient/ineffective monitoring	There is a risk that project implementation will be hampered by the fact that there is no good monitoring.

6.2.2 Transversal Rights

The positive effects that can be observed with the implementation of Modalities 1 and 2 of the Project, which influence the panorama of transversal rights, are generic and closely related (transversal) with the dimensions "Territories and Cultures" and "Livelihoods". In this sense, it stands out:

- Possible positive impact on improving the socioeconomic conditions of family farmers, in a region withthe lowest Human Development Indexes in Brazil;
- Possible opportunities to reduce conflicts between segments of the local population; and
- Promote family farming.

However, these possible positive effects do not necessarily imply an improvement in the conditions of gender equality and the guarantee of good labor conditions (harmed by the COVID-19 pandemic situation), especially for the youngest and for certain marginalized and more vulnerable groups. It is, therefore, important to establish strategies for the Floresta+ Pilot Project aimed at these issues in a particular way in its Management Plan and in its monitoring mechanisms.

Since slave labor in Brazil is found in deforestation zones in the Amazon and in rural areas with high rates of violence and land-related conflicts, and that most children in child labor are employed in agricultural establishments with ties of kinship with the producer, the Floresta+ project may be an opportunity to minimize these contextual problems. It should be borne in mind that most of people in a condition analogous to slavery are in the agricultural and livestock sector, fall into the "race" Dark-skinned, Mulatto, Cabocla, Cafuza, Mameluca or Black half-caste, are between 18 and 29 years old, is illiterate or has not completed the 5th year of schooling and is male.

In the development of the Floresta+ Pilot Project, there is an opportunity to strengthen institutional and governance capacity in the territories where it will be implemented, which would mean a gain in human rights for the local population, not just the direct beneficiaries in modalities 1 and 2, in as the structure and functioning of institutions facilitate access to public services and rights.

As for the negative effects on transversal rights, the main contextual problems concern the weak institutional capacity of the state governments to operationalize the CAR and the municipal governments to collaborate with those interested in carrying out the registration. This may trigger inequalities in access to PES by potential beneficiaries of Modalities 1 and 2. It is identified that access to PES will be more difficult for people:

- With poor economic conditions and unable to pay for services to fill in data and send information to SICAR.
- With less education, noting that most family farmers have only completed elementary school.
- Women, as only approximately 20% of rural establishments belong to women and registration in the CAR does not directly provide information on the beneficiary's gender, age, family typology; and
- People who live isolated or reside in locations where the government and other public interest entities of a collective nature are less able to assist the registration process, such as, INCRA (with reduced human and financial resources) or the labor unions, which do not always reach all rural workers.

Likewise, these inequalities can be intensified in the steps following the public call notice by:

- Lack of information, given the limited access to telephone and mobile phone or e-mail, since 96% of rural landowners do not have e-mail;
- Difficulty in accessing the internet, as more than 80% of rural properties in the Legal Amazon do not have internet access;
- Difficulty in accessing financial institutions, such as banking establishments, since there are municipalities in the Legal Amazon without any bank; and
- Difficulty in accessing clarifications on the monitoring process and on grievance and conflict redress mechanisms, not yet defined at this stage of the project.

As highlighted in chapter 5, the guarantee of human rights depends on the institutional and governance capacity enabling access to: information, participation, public services and, ultimately, the basic rights for a decent life and full exercise of citizenship. This institutional and governance structure, considering criteria to promote gender equality and good labor conditions will be essential to avoid negative impacts related to these premises.

6.2.3 Territories and Cultures

Modalities 1 and 2 of the Floresta+ Amazônia Pilot Project have as potential beneficiaries the owners or holders of rural properties whose total area does not exceed the 4 Tax Modules and the main form of access to the Pilot Project by the PIPCT will be through Modality 3. Even thus, the implementation of Modalities 1 and 2 should have effects on the dimension of analysis called "Territories and Cultures", since one of the criteria (criterion v) to prioritize these same beneficiaries will be "to have greater proximity to Indigenous Lands". It is admitted that

what is intended by the programmers is to ensure a greater extension of the spatial continuity of the geographical area with native vegetation preserved by these peoples.

It can be seen, among the contextual problems, that the implementation of the Floresta+ Project could increase:

- the number of registrations of rural properties in the CAR with dimensions larger than the real ones; and
- the overlapping of areas of properties and possessions, with protected areas, rural settlements and indigenous peoples and traditional communities' territories.

The resistance of the PIPCT in these territories has impeded the advance of deforestation, but the protection of forests depends on government actions that ensure the right for the territory, where they can safely extract the natural resources. Therefore, it is important to complete the recognition of communal territories that are in the process of land and environmental regularization, which will enable the transfer to community domain some land that are desired in the land market, protecting such territories from deforestation.

The main aspect of the Floresta+ Amazônia Pilot Project in Modalities 1 and 2 requires the validation of the CAR. Consequently, through a positive view of this requirement, it is possible to anticipate that land regularization can reduce the problems of territorial disputes, through the crossing of land information, reduce overlaps of areas, creating inter-institutional mechanisms in the states to speed up the CAR registration process in rural locations, especially in traditional territories.

6.2.4 Livelihoods

Among the Project's potentialities in the sphere of "Livelihoods", perhaps the most significant is the promotion of environmental regularization of rural property, which brings with it the possibility of producer access to financing and financial programs to improve the property's productive conditions. This incurs in improving the quality of life of the population, promoting not only the rural owner, but also the entire local economy, through the circulation of money and resources, enhancing organic agricultural production, but a the same time creating a stronger environmental awareness in the locality for current and future generations. It also brings the recovery of native vegetation and strengthens the desire to preserve intact vegetation.

It is recognized that CAR plays an important role in the conservation and restoration of native vegetation, being one of the main tools to ensure the environmental regularization of rural properties. Validation of CAR data is essential for implementing restoration, environmental recovery and offset tools. However, the degree of maturation of CAR differs from state to state. The low number of validations is a challenge for the achievement of Brazilian biodiversity goals, and consequently a challenge for producers who want to join the Floresta+ project, since having the CAR validated is a prerequisite for participating in the project.

Registration in the CAR is free and can be done online by the owner of the rural property, or whoever intends to do so. However, specific documents of the property and georeferencing are necessary, being the latter process the one with high cost. As mentioned, in the states of Legal Amazon and in their respective municipalities there is a lack of access to the internet and consequently to information, which makes the rural producers resort to consulting companies to carry out the registration with SICAR (Rural Environmental Registration System), and it is these companies that raise the cost of the registration process. It is important to point out that it is the duty of the public authorities to support the registration of the project's beneficiaries (family farming). Although, this support is not perfect, it has occurred, with resources from the Amazon Fund and other projects.

It is important to consider who would be able to register and validate the CAR, the distribution of the Payments of Environmental Services could be unfair, which would represent a negative impact of the project, and could even trigger local conflicts for financial resources made available. Another problem that should be addressed is that the expectation of being a beneficiary of Modalities 1 and 2 motivates an increase for land acquisition, registration in the CAR and, later, its validation. In some cases, this process may expand the land grabbing

process and the payment of bribes to state body entities for validating the CAR. Hence the importance of aspects of transparency and prevention of corruption by the Floresta+ Project.

The use of CAR by large landowners as a form of land grabbing must be avoided. These landowners use to identify areas that do not yet have a proper land title (land that is under claim or land tenure regularization process), insert the GPS data in the SICAR, as this is self-declaratory process. Although the CAR is still not enough to guarantee the title deed, it is being used as an instrument to expel people and occupy the land. The next step is to obtain an improper title of ownership of the area.

The distribution of resources through the PES mechanism must be careful not to be unfair, contributing to the valuation of benefited properties at the expense of the devaluation of small non-benefited properties, as this could favor the purchase of land from small producers by large landowners and incorporated into their large rural property.

Eligibility criteria must be clear to ensure project success and legal certainty for beneficiaries. Among the steps required to participate in the project are having a CAR registration, having the CAR validated, responding to the Public Call Notice, having an excess of native vegetation above the Legal Reserve (RL) (Modality 1) or being in the process of recovering Permanent Preservation Area (Modality 2). The existence of native vegetation superior to the Legal Reserve can make it difficult to understand whether to participate in the project. The Project Operational Manual states that the beneficiary of Modality 1 must "own, on the date of entry into the project, an area with native vegetation exceeding the requirements of RL and Permanent Preservation Area (APP). These patches of native vegetation must be greater than or equal to 1 ha in total, and at least 0.5 ha of continuous area with native vegetation exceeding the RL on the project entry date". The lack of technical methodologies for checking and monitoring this very detailed requirement is a risk to the project about Modality 1).

For Modality 2, the beneficiaries will have to "own, on the date of entry into the project, a minimum area of 0.5 ha of APP liabilities in a continuous area. Likewise, there are uncertainties regarding the mechanisms for checking and monitoring.

The unequal distribution between Modalities 1 and 2 can also make the Floresta+ Amazônia Pilot Project less attractive to rural producers. In Modalities 1 and 2 is foreseen payments of R$250/year per hectare of Legal Reserve (only the extra area of vegetation leftover beyond the establish by the law) or of R$150/year per hectare of recovered APP. The financial value referenced for the payment for environmental services may be insufficient to stimulate the interest of small rural producers and family farmers, especially for the area to be recovered, making Modality 2 less attractive to rural producers, who prefer to use these lands, although this is not a legal option. The PES must be more attractive to the rural producer, to the point that he prefers to join the project instead of cutting down a legal reserve area and/or producing in the area even though it is degraded or in use.

The form of PES proposed for Modality 1 foresees that in the implementation of the Pilot Project Floresta+ 20 thousand hectares are contemplated at the value of R$ 250.00 per hectare, totaling a payment of 20 million reais in a period of four years; in the second year, an additional 80,000 ha will be contemplated, with a disbursement of 60 million reais in three years; in the third year, payment will be made for an additional 200,000 ha, representing 100 million reais in payment over a 2-year period; and in the fourth year, it is intended to cover another 80,000 ha, totaling 20 million reais.

According to the schedule of disbursements provided for in the project, the total transfers by PES will be 200 million reais, however, for this modality, it is estimated that the available resource is 242 million reais, with 42 million reais remaining to be applied, but there is no specific purpose for this financial resource.

The alternative way to annual PES is to engage the beneficiary who meets the criteria for joining the Project, make the total transfer, with the farmer engaged over the 4 years, equivalent to what he would receive per year, for the resource already achieved from REDD on your property.

In relation to Modality 2, the execution schedule foresees the implementation of 5 thousand ha in the first year, with the value of R$ 150.00 per ha, totaling payment of 3 million reais during the period of 4 years; in the second year, it is intended to implement 30,000 ha, totaling 13.5 million in payments over 3 years; in the third year, resources will be allocated for the payment of over 80 thousand ha, whose PES value will be 24 million reais for a period of 2 years; and in the last year of execution, 65 thousand ha will be benefited, which means a transfer of 9.75 million reais through a single payment.

In Modality 2 there will be a total of 50.25 million reais in PES, however the resource allocated for this modality is 62 million reais, and it is necessary to clarify the purpose given to the remaining 9.75 million.

The value of the PES for Modality 2 of R$ 150.00 paid for the recovery of APP per hectare, incurs a high risk of lack of interest on the part of the beneficiaries due to the amount paid, considering the willingness to adhere to the Project and the recovery of this area should be confirmed. More appropriate would be to compare the value offered by the PES with the costs inherent to the recovery process.

6.2.5 Biodiversity

The impacts of Modalities 1 and 2 on the analytical dimension “Biodiversity” are subtly different from each other. Thus, the assessment is presented in a subdivided way.

Modality 1: Conservation

Modality 1: Conservation has the general objective of promoting the conservation of areas of native vegetation that exceed the legal requirements for rural properties established in the Native Vegetation Protection Law. This objective will be achieved through the attribution of financial incentives to family farmers in the Legal Amazon that conserve areas of native vegetation in addition to the Legal Reserve requirements. This modality should expand the possibilities of maintaining in rural properties and possessions areas covered by native vegetation with sizes larger than the minimum required by law. This aspect will have a positive impact on biodiversity as more area of native habitat will be preserved.

An important factor to enhance the positive impact of this modality is the fact that the Pilot Project defines criteria to prioritize eligible payments. These criteria are defined by region and by beneficiary.

At the regional level, one of the relevant criteria for this assessment is that the property is located in 'priority areas for biodiversity conservation, sustainable use and benefit-sharing of Brazilian biodiversity or priority areas for biodiversity and native vegetation restoration' (according to Ordinance of MMA No. 463 of December 18, 2018). This criterion focuses on intervention in areas that are important for biodiversity, thus avoiding the dispersion of funds in less relevant areas.

At the level of beneficiaries, the criteria should be highlighted here:

- Rural property located in the vicinity of Conservation Units, located within the Conservation Unit (UC) buffer zone, when this is already determined in its creation instrument, specific regulation or Management Plan, or, if the area of damping has not yet been identified, within a radius of 3 (three) km from the limits of a UC;
- Rural property located predominantly in the interior of APA or RPPN;
- Rural property located in regions with a high concentration of Indigenous Peoples and Traditional Peoples and Communities;
- Have a larger area with native vegetation more than the legal reserve compared to other eligible rural properties.

A relevant factor for the success of biodiversity preservation policies is to encourage/preserve the 'continuity of areas'. Global preservation will be even more successful the greater the continuous area of Legal Reserve

and its proximity to areas that already have some protection status, thus avoiding the fragmentation of the ecosystem.

The characterization of the baseline presented in Chapter 5 demonstrated that historically, deforestation within Conservation Units, as with Indigenous Lands, is significantly lower than in non-protected areas. However, in recent years (2018, 2019, 2020) there has been a trend of growth in the deforested area in these protected areas, which may tend to constitute a growing threat to the biodiversity present there.

In addition to the prioritization criteria, there are also eligibility criteria. One of the basic criteria for accessing the PES Pilot Project is that the area is registered in the CAR and that there is environmental regularity in the area's legal reserve. These criteria may serve as an incentive for landowners to regularize their registration status, which indirectly will have positive effects on biodiversity as there will be fewer irregular situations of deforestation and monitoring of a larger area. The pilot project is thus an opportunity at this level, with positive effects on biodiversity.

By using these prioritization and eligibility criteria, a reduction in the rate of deforestation in these areas is expected, so the project will contribute to achieving some of the SNUC's own objectives, namely:

- contribute to the maintenance of biological diversity and genetic resources in the national territory and in jurisdictional waters;
- protect endangered species at the regional and national level;
- contribute to the preservation and restoration of the diversity of natural ecosystems;

However, although the Floresta+ Pilot Project during the period of its implementation (4 years) promotes the preservation of biodiversity through the maintenance of surplus native vegetation in rural possessions and properties, there is a risk that at the end of this period, if there is no continuity of the PES, the situation will reverse. In other words, if there is no longer an obligation to safeguard RL beyond what is legally stipulated, with no financial return via PES, the family farmer can proceed with the felling of the forest and thus negatively affect biodiversity.

Modality 2: Recovery

Modality 2 Floresta+: Recovery has the general objective of promoting the recovery of Permanent Preservation Areas (APP), thus promoting the implementation of the Native Vegetation Protection Law.

As mentioned above, based on Brazilian law, vegetation located in a Permanent Preservation Area must be maintained. If the removal of vegetation located in a Permanent Preservation Area has occurred, the owner of the area, possessor or occupant in any capacity is obliged to promote the restoration of the vegetation, except for the authorized uses provided for in the Law.

In this context, the attribution of a financial incentive to the recovery process will facilitate the engagement of the family farmer in promoting such recovery, which has associated costs, not least because this incentive will contribute to the environmental regularization of the beneficiary. There is, however, here a risk that there is a reduced adherence to this modality due to the value of the incentive possibly not being sufficient in view of the costs that such recovery may entail.

Through this modality, the recovery of degraded APP areas will have positive impacts on biodiversity, as APPs, among other functions, promote the preservation of biodiversity and facilitate the gene flow of fauna and flora, especially when they correspond to marginal strips of natural watercourse. It will help to protect endangered species.

To strengthen the success of Modality 2, like Modality 1, the Project Operational Manual imposes a set of criteria for prioritizing payments. These criteria are defined by region and by beneficiary, pointing out as relevant in the context of this assessment those already mentioned for the Floresta + Conservation modality, that is: considering the areas defined by the MMA as 'priorities for biodiversity conservation, sustainable use and distribution of benefits of Brazilian biodiversity or priority areas for biodiversity and native vegetation

restoration', rural property located in the vicinity of Conservation Units, located inside the Conservation Unit (UC) buffer zone, when this is already determined in its instrument creation, specific regulations or Management Plan, or, if the buffer zone has not yet been identified, within a radius of 3 (three) km from the limits of a UC; rural property located predominantly in the interior of APA or RPPN or rural property located in regions with a high concentration of Indigenous Peoples and Traditional Peoples and Communities.

The APPs have a strategic function of connectivity between natural fragments and the protected areas themselves, which are fundamental for the conservation of biodiversity. The prioritization criteria make it possible to exponentially grow the positive impact of the project as they will foster ecological continuity between protected/priority areas, mitigating the fragmentation of ecosystems.

The recovery of APP areas either inside the UC or in the vicinity of important areas such as Indigenous Lands, in addition to promoting the restoration of important habitats and ecosystems, such as riverine ecosystems, will facilitate gene communication throughout the various recognized areas by the National Strategic Plan for Protected Areas. These expected results are in line with SNUC's own objectives.

In addition to the prioritization criteria, there are also eligibility criteria to adhere to the PES project, including: the area must be registered in the CAR, the property must have an approved legal reserve status, there is no other environmental infringement besides the deforestation of the area of APP to be recovered, not having another property in breach of the law for the protection of native vegetation. These criteria may serve as an incentive for landowners to regularize their registration status, which indirectly will have positive effects on biodiversity as there will be fewer irregular situations of deforestation and monitoring of a larger area. The pilot project is thus an opportunity at this level, with positive effects on biodiversity.

This opportunity can, however, be nullified by the risk that there may be a reduced adherence to this modality due to the incentive (amount paid per hectare) not being sufficient to cover the costs that such recovery may entail and so the owner prefers to remain in anonymity preferring not to regularize their situation.

6.2.6 Climate Change

Both Modality 1: Conservation and Modality 2: Recovery of the Floresta+ Amazônia Pilot Project have the objective of “strengthening and promoting the implementation of the Law for the Protection of Native Vegetation”. Although it seems obvious that this wide-ranging strategic objective should coincide with the initiatives needed to mitigate and adapt to climate change, it is advisable to develop a careful assessment exercise. Given the differences between Modality 1 and Modality 2, the assessment exercise will be carried out separately.

Modality 1: Conservation

This modality will benefit family farmers who have a surplus of native vegetation in relation to what is required by law. What is required by law is called Legal Reserve, defined as the area located within a rural property or possession, with the function of ensuring the sustainable economic use of the rural property's natural resources, assisting in the conservation and rehabilitation of processes and promote the conservation of biodiversity, as well as the shelter and protection of wild fauna and native flora. In other words, family farmers who are considered eligible for this modality will receive a payment for not deforesting a part of their land area that could be intervened without causing any legal non-compliance.

Modality 1 thus works as an incentive to reduce deforestation, contributing to the mitigation of savannization in the Amazon. Furthermore, the conservation of native vegetation will have a positive impact on maintaining the evapotranspiration conditions of the forest and will consequently promote the maintenance of the local hydrological balance. It is considered that this initiative will also favor the stabilization of the microclimatic characteristics of the intervention area. However, it is not possible to estimate the magnitude of this impact, which depends on the geographic distribution of beneficiaries. It is known that, in total, 380,000 hectares will be supported over approximately 4 years. Assuming continued support from the same farmers during the entire

4 years, it makes a total of about 95,000 hectares of area that will maintain the native vegetation. The dimension of the climate benefit would be maximized if more contiguous areas of forest are spatially prioritized. It should be remembered that considering the definition of a legal reserve, the absolute contiguity of these forest areas (950 continuous km^2) can never be guaranteed. If there is a wide geographic dispersion of the benefit, the microclimatic impact, although positive, will have a dimension close to nil.

Another positive impact on climate change arising from the implementation of Modality 1 focuses on the Carbon balance. This impact has two perspectives: ensuring an additional carbon sequestration capacity by preventing the transformation of forest to pasture (for example) and, in the extreme case, preventing the emission to the atmosphere that would occur if deforestation were achieved through slash-burning.

Estimating the carbon balance of Amazonian afforestation/deforestation is enormously complex and requires detailed analyses. It is not intended here to develop this detailed study. However, it is interesting to develop a simple estimate of the effect of Modality 1 on CO_2 emissions to be able to relativize the magnitude of the impact. The calculations presented below are based on the following carbon sequestration potential values:

- Potential for native forest sequestration: 1.2 Mg C/ha/year (Higuchi et al., 2004);
- Sequestration potential for pasture 0.27 Mg C/ha/year (Carvalho et al., 2010);
- Forest/pasture conversion by slash-burning 100 Mg C/ha/year (Dias-Filho et al., 2001).

So for a forest area of 95,000 hectares:

- Native forest carbon sequestration supported by Modality 1: Conservation: 114,000 Mg C/year;
- Carbon sequestration of the same forest area if it becomes a pasture area: 25,650 Mg C/year

It results that the implementation of this Modality, by avoiding deforestation, provides an additional capture of 88,350 Mg/year. Over 4 years, the additional carbon sequestration achieved by the implementation of Modality 1 will be 353,400 Mg of carbon, equivalent to 1.296 million tons of CO_2.

Thus, it is concluded that Modality 1: Conservation, by motivating the change in the behavior of the beneficiaries in relation to the maintenance of an area of native vegetation, has a positive impact on the prevention and consequent reduction of atmospheric CO_2 emissions.

However, if after the end of the Floresta+ Pilot Project, the incentives to stop deforestation ended, resuming the process of transformation of land use through slash-burning, then there would be an emission of:

- Emission from the conversion of forest to pasture: 9,500,000 Mg C/year, equivalent to a CO_2 emission to the atmosphere of 34.8 million tons.

This value would correspond to an increase of about 6% of the average CO_2 emissions in the Legal Amazon (between 2010 and 2019) caused by changes in land use (554.5 million tons (SEEG, 2021). Additional carbon sequestration achieved over 4 years with the Floresta+ Pilot Project prevents only 4.8% of the CO_2 emissions caused by the slash-burning of the same area of forest after 4 years. These figures demonstrate the importance of ensuring the continuity of this initiative beyond the period of payments determined.

Modality 2: Recovery

Modality 2 of the Floresta+ Amazônia Pilot Project (Recovery) will financially benefit landowners and owners of small rural properties that are in the process of recovering Permanent Preservation Areas (APP). It is thus intended to support the recovery of native vegetation in areas particularly sensitive to important ecological processes, such as riparian forests and water sources of the Legal Amazon.

As in the case of Modality 1, it is considered that the implementation of this Modality translates into positive impacts, both in terms of the preservation of local microclimatic and hydrological conditions and in the expansion of carbon sequestration.

Regarding microclimatic and hydrological conditions, it is essential to value the fact that the Project's Operational Manual identifies riparian forests and springs as particularly sensitive areas. Riparian forests are forests, or other types of native vegetation cover, which are located on the banks of rivers, streams, lakes, water holes and dams.

The transformation of land use into pastures is one of the reasons for the destruction of riparian forests. The greater humidity of the floodplains and riverbanks allows for better development of pastures in the dry season. Some producers also deforest so that the igarapés can increase their water production during the dry season. This reality is since trees no longer “pump” water used in the transpiration of plants. Over time, this practice has the opposite effect, as with the absence of riparian forest there is a lowering of the water table.

Encouraging the preservation of riparian forests and springs will contribute to the maintenance of the hydrological cycle in the more upstream areas of the extensive and complex hydrological networks of the Legal Amazon. Assuming, as in Modality 1, that continuous support will be given to the same family farmers, the total geographical area covered by this Modality will be 45,000 hectares (180,000 ha/4 years). Given the particularly sensitive and relevant character for the local hydrology of the selected areas, the impact is considered positive and significant regardless of the strategy adopted in the geographic distribution of the support: densified or widely distributed in the Legal Amazon.

The recovery of these areas, transforming them from areas with degraded forest into areas with native forest, will increase their carbon sequestration capacity. In estimating this carbon balance, it is considered, in a simplified way, that the degraded forest (capoeira) achieves a carbon sequestration close to 20% of the native forest (primary) (Ribeiro, 2007). Based on this parameterization and for a forest area of 45,000 hectares:

- Carbon sequestration from native forest supported by Modality 2: 54,000 Mg C/year;
- Carbon sequestration from degraded forest supported by Modality 2: 10,800 Mg C/year;

As a result, the implementation of Modality 2, by promoting the recovery of degraded forest areas, provides an additional sequestration of 43,200 Mg/year. Over 4 years, the additional carbon sequestration achieved by the implementation of Modality 2 will be 172,800 Mg of carbon, equivalent to 0.634 million tons of CO_2.

Thus, it is concluded that Modality 2: Recovery, by motivating the change in the behavior of the beneficiaries in relation to the maintenance of an area of native vegetation, has a positive impact on the increase in the capacity for carbon sequestration.

6.2.7 Impacte Assessment

From the point of view of what has been called "positive effects", based on a phased analysis of Modalities 1 and 2, the project presents an opportunity to influence the environmental regularization of properties and promote positive impacts such as: expanding preservation areas and environmental recovery and generate extra income that can be received by beneficiaries, improving their socioeconomic conditions.

It should be noted, however, that the negative effects understood as “context problems” related to the CAR are critical, highlighting the fragility of registration and consequent delays in validation. The following steps, in response to the public call notice (including disclosure, internet access and monetary value of the payment) and inadequate monitoring, as well as the possible discontinuity of the PES, may represent negative effects that

affect the project's objectives. Table 6-5[98] below systematizes this information according to the effects and relates it to the thematic dimensions under analysis (Transversal Rights: DT, Territories and Cultures: TC, Livelihoods: SE, Biodiversity: Bio, Climate Change: MC).

Table 6-5. Analysis of the effects of the Floresta+ Amazônia Pilot Project according to the actions necessary for the _operationalization of Modalities 1 and 2.

	MODALITIES 1 e 2	Assessment	DT	TC	SE	BIO	MC
C	Be registered in theCAR	The possibility of receiving a financial benefit through payment for environmental services may encourage abusive registration. There are overlaps with Indigenous Lands and other collective areas. There may be an increase in land disputes due to the interest in receiving PES.	X	X	X		
O		Encourages the environmental regularization ofproperties			X	X	
C	Have CAR validated	The number of CARs validated seems insufficient to implement Floresta+ in the required schedule. The achievement of the objectives of Floresta+ will dependon the capacity and interest of each of the States in accelerating the CAR validation process, as well as guaranteeing access to the CAR for potential project beneficiaries who, in principle, are not able to proceed with their registrations on their own.	X	X	X		
R	Respond to the PublicCall Notice	The application process could be interpreted as too complex by a large part of the beneficiaries. Pre-existing discredit. Difficulty accessing the internet and lack of information. Less representation of women.	X		X		
P	Requires having an excess of native vegetation above the RL (MOD1) or being in the process of recovering a Permanent Preservation Area (MOD2)	Encourages the implementation of LPVN. Promotes the maintenance and expansion of the coverage area with native vegetation (MOD1) or the recovery of the Permanent Preservation Area (MOD2). Promotes family farming. It contributes to climate stability and enhances carbon sequestration capacity. Promotes the importanceand appreciation of Environmental Services. Promotes environmental awareness of beneficiary populations			X	X	X
R	Payment of R$250/yearper hectare of surplus Legal Reserve area or R$150/year per hectare of recovered APP	There is a risk that the amount paid is not attractive to potential beneficiaries	X		X		
R	Have access to financial institution	The beneficiary population has low access to banking services.	X		X		
P	Receive payment	Improvement of the socioeconomic conditions of family farmers. Improved quality of life. It financially values the activity of environmental conservation and recovery.	X		X		
R		It can trigger conflicts for the financial resources made available by the project.	X	X	X		
R	Monitoring	It will involve the SFB as well as competent state agencies. The organization, implementation and structuring of the monitoring process is unknown.	X			X	X

[98] Tables 6-8 and 6-11, referring to modalities 3 and 4, respectively, follow the same pattern of analysis by dimensions.

	MODALITIES 1 e 2	Assessment	DT	TC	SE	BIO	MC
R	PES Continuity	The continuity of the project or the implementation of a permanent PES public policy for the region is not assured. This situation may encourage discredit on thePilot Project			X	X	X

6.3 MODALITY 3:COMMUNITIES

Modality 3 aims to support the implementation of local projects aimed at strengthening environmental and territorial management in the territories of indigenous peoples and traditional peoples and communities (PIPCT). According to the Project's Operational Manual, “local projects must be prepared in a participatory manner by organizations that represent the PIPCT, taking into account the collective nature of management activities in these territories”.

Through this modality, actions will be financed to promote:

- environmental conservation,
- the recovery of degraded areas,
- agroecological production,
- the strengthening of supply chains for products from the Amazonian socio-biodiversity and
- territorial surveillance and protection, among others.

6.3.1 Perceptions

The perceptions of interest groups regarding the global assessment show how the PIPCT can be positively impacted by improving the quality of life and opportunities with the promotion of sustainable production (strengthening extractivist activities, introducing new technologies and tourism), reducing the food deficit and territorial conflicts, through the promotion of partnerships among other organizations, the strengthening of the PIPCT, as well as the effective protection of their territorial rights.

The implementation of the Pilot Project Floresta+ in Modality 3 is perceived as promoting the strengthening of traditional communities, with the recognition of cultural diversity and specific forms of cultural, social, religious, ancestral and economic reproduction, occupying and using their traditional territories.

Another aspect that was raised was the possibility of promoting the strengthening of indigenous peoples, about the sustainable use of natural resources in indigenous lands, using the Territorial and Environmental Management Plan for Indigenous Lands (PGTA) as an instrument, prioritizing:

1. the control and protection of the territory, including monitoring practices carried out by indigenouspeoples,
2. the sustainable management of natural resources to promote food security and income generation, aswell as the preservation, restoration and sustainable use of land and
3. capacity building and institutional strengthening of local organizations.

Another positive impact concerns the strengthening of organizations representing the PIPCT with participation and protagonism in all stages of the Floresta+ Amazônia Pilot Project. In this case, the participants identified as a positive impact the obligation that local projects must be prepared in a participatory manner by organizations of the PIPCT or that work directly with them.

It also presents the perceptions of negative impacts, related to the increase in land and natural resource conflicts, impacts on local culture, commodification of forests, low participation of the PIPCT in project governance due to the lack of recognition of their role as a protagonist in forest conservation and climate balance. The negative perceptions of the project context were also evidenced regarding the understanding of

a complex series of problems inherent to the PIPCT categories, in relation to the applications and selection of collective projects, due to the great diversity of beneficiaries, individual CAR with overlapping traditional collective areas, lack of registration/regularization of territories, default by organizations, lack of more information and difficulty in accessing the internet, lack of reference to the circular economy and food policy, lack of engagement of young people and the very security of these populations.

The main risks evidenced in the participatory workshops were the lack of continuity of the project, the lack of clear criteria for women's participation and the possibility of increasing territorial conflicts against the PIPCT, as shown in tables 6-7, 6-8 and 6-9.

As for the perception of project management by organizations representing traditional peoples and communities, one can observe a similarity in this situation. Representative organizations have low capacity in project management. Therefore, most organizations are in default. The problems mentioned are related to the low technical capacity in project management, which compromises adherence and participation in Modality 3.

Another negative impact was the low participation of PIPCT in project governance. It is considered that the project will have difficulty considering the diversity of PIPCT and their representative organizations, which may increase the negative impacts on the consultation process, regarding government programs and policies that affect it.

A negative aspect is the perception that the project is a unidirectional and vertical model, implemented by the Brazilian State to persuade and convince the PIPCT to adopt the ideas and points of view of being just a project with the purpose of commodifying forests. This problem is accentuated because from the perceptions of representatives and leaders of the PIPCT, during the participatory workshops, there is no commitment on the part of the State to carry out the consultations (Free, Prior and Informed Consent), since Decree No. 5051/ 2004 which promulgated ILO Convention 169 has provisions that support these instruments.

Table 6-6. Positive effects of the Floresta+ Amazon Pilot Project: Modality 3.

Effect	MOD3	Description
Positive impact	Strengthening of traditional communities	Allows the assessment of what has been done by the communities, what has been done right and what has been done wrong, strengthening the actions of the communities. It contributes to confronting agribusiness that promotes occupation with deforestation in areas, for example, the life of coconut breakers, extractive populations, quilombolas and indigenous peoples.
	Strengthening Indigenous Peoples	Allows the implementation of initiatives outlined in the Environmental and Territorial Management Plans. It will foster the autonomy of indigenous peoples and allow the involvement of the population.
	Strengthening of representative organizations	With the receipt of the Project's resources, actions that were stopped or reduced due to lack of financial resources can be enhanced.
	Strengthening of extractivism	
	Promotes the creation of partnerships betweenorganizations	Encourages the integration and exchange of experiences between communities, associations and other organizations, mediated by the institutional structure of the Floresta+ Project.
Opportunity	Promotes tourism	The project may favor visits to villages promoting sustainabletourism.
	Reduces the food deficit	Provides some type of work and income that will minimize the food deficit issue.

Table 6-7. Negative effects of the Floresta+ Amazon Pilot Project: Modality 3.

Effect	MOD3	Description
Context problem	Lack of registration/regularization of territories	There are weaknesses in the registration of some Indigenous Lands and territories of Traditional Peoples and Communities that may impede access to the project.
	Non-fulfilment by organizations	Non-fulfilment by indigenous organizations may limit participation in the project. As there was no prior preparation (there was no clarity about accountability obligations) these organizations were not successful in reporting on their previous activities.
	Poorly prepared organizations	Lack of preparation of organizations to prepare Projects and organization for management. Organizations that do not havepartnerships, but that do important groundwork. Inequality of participation and access of different indigenous peoples.
	Lack of safety	Risk to the life of the guardians who make the direct defensewith the work of protection, the confrontation of invaders, which is aggravated by the omission of public authorities. Bureaucracies make it even more difficult for help and protection to arrive. Conflicts in surrounding forest areas can put pressure on indigenous lands.
Negative impact	Cultural impact from "commodification of forests"	The project introduces a 'conflict' between the PES concept and the cultures of different peoples (indigenous, traditionalcommunities) Action by responsible parties that do not guarantee the participation and decision of the peoples and communities involved, producing negative impacts on the traditional formsof organization of these groups. Commodification of forests
	Low participation of PIPCT in project governance	Some stakeholders consider that there is insufficient participation that does not encompass the diversity of social actors on the ground. Floresta+ still does not provide mechanisms and tools that necessarily guarantee the participation of PIPCT in projects to be developed by organizations in the sphere of Modality 3. It is a concern with the effective participation and autonomy of PIPCT in governance and not as mere "receivers" of projects developed by third parties.
	Low recognition of the role of IndigenousPeoples	Inequality in Project Modalities and resources devaluing theconservation and environmental protection that indigenous peoples promote.
Risk	Expansion of territorial conflicts	Possible interests of private companies in the territories of indigenous peoples and traditional communities could increase conflicts.

6.3.2 Transversal Rights

In assessing the impacts of Modality 3 of the Floresta+ Amazônia Project, it is not possible to fully distinguish the effects related to “transversal rights” from the “territories and cultures” and “livelihoods” dimensions. That is why it is important to state that the project must:

- Guarantee collective rights for indigenous peoples and traditional communities;
- Observe gender equality when implementing projects in beneficiary communities;
- Contain strategies to reduce land or other conflicts that disturb the peace and secure life of communities; and

- Not harm the development and maintenance of traditional cultures and the access of these populations to natural resources, their ecosystem and environmental services, which are directly related to their ways of life.

The strengthening of indigenous peoples, traditional and extractivist communities and the organizations that represent them could be an important positive impact of the Floresta+ Pilot Project. Reinforcing the importance of observing Sustainable Development Goal No. 17 (Partnerships for the Implementation of Goals), that is, fostering partnerships between communities, associations, other organizations and public institutions to achieve better levels of sustainable development, including in the social and environmental front. Another positive effect to be registered is the opportunity that the Project must contribute, even if indirectly, with the reduction of the food deficit faced by the population of the Legal Amazon and with the promotion of sustainable tourism.

From the point of view of the possible negative effects arising from the Project in this modality and regarding the dimension of "transversal rights", the contextual problems of low institutional capacity are again highlighted, in this case verified by the difficulties with the demarcation of land and regularization of the territories in question. The changes observed in the legal frameworks for land and environmental regularization in the country, led to the registration of rural properties in the CAR with dimensions larger than the real ones and the overlapping of areas of properties and possessions, with conservation units, rural settlements and areas of indigenous peoples and traditional communities. The possible default or some administrative irregularity on the part of organizations, which do not always have the material and human resources to meet all the bureaucratic requirements for government projects or other public interest projects, represents another difficulty in the context in which the project will be implemented.

Still as a problem of context, the lack of safety in the lives and territories of indigenous populations stands out, with difficulties in being “rescued and protected” by governmental bodies. Workshop participants reaffirmed the risk that any type of conflicts and disputes around forest areas could represent pressure and insecurity for indigenous territories and traditional communities.

Uncontrolled fires can be a generator of conflicts in these territories. Considering the process of preservation or even recovery from the project approved for the community, fires started in nearby areas can enter the community's preservation area, which creates yet another focus of conflict. Other important issues will be addressed in the evaluation of the dimension of analysis “Territories and Cultures” below.

The potential to finance projects, through Modality 3 of Floresta+, which promote the best conservation results, which are supported by Territorial and Environmental Management Plans, gives this Modality a unique guarantee (not existing in the other Modalities) of being collectively legitimized and result from a strong involvement and mobilization of the community to think, collectively, how to organize, use and guarantee the maintenance of the territory. These actions define the way that each community must relate to the land, both in its material and symbolic perspective. And it is the support for this self-management of its own territory that ensures the maintenance of traditions, social organization, for the generation of income and the sustainability of these spaces, avoiding impacts, especially environmental, that could compromise extractivism and family farming (N'Golo, 2020).

However, the invasion of indigenous lands, as well as the increase in conflicts and violations of territorial rights are a serious threat to the "Transversal Rights", to the "Territories and Cultures" and to the "Livelihoods" of these communities of these communities as well as Biodiversity itself and Climate Change. The Floresta+ Amazônia Pilot Project can leverage synergies and become a guarantor against threats of invasion of IT and quilombola territories or other peoples and communities not yet regularized. Modality 3 can accelerate the processes of regularization, construction of collective projects and promotion of ethno-development in these territories, as well as strengthening territorial surveillance.

6.3.3 Territories and Cultures

As for the positive impacts of the Floresta+ Project in Modality 3, there is the possibility of implementing local projects in addition to promoting Environmental Services, since the implementation of a project of this nature aims to promote a greater portion of collective use of forest protection. The implementation of the Floresta+ Pilot Project in Modality 3 is perceived as promoting the strengthening of traditional communities, with the recognition of cultural diversity and specific forms of cultural, social, religious, ancestral and economic reproduction, occupying and using their traditional territories.

A positive aspect may result from the inclusion of actions aimed at improving the quality of life of PIPCT, with the demand for new agro-ecological production technologies and base for other economic activities, such as tourism in its various modalities (rural, sustainable, of adventure and others) for the promotion of protected areas, for example in Sustainable Use Conservation Units. These actions arising from the implementation of collective projects tend to promote sustainable production and the strengthening of PIPCT social movements, especially the women's movement.

As important as identifying the positive impacts is identifying the opportunities that the Floresta+ Project can favor. In this sense, it is important to consider the potential of partnerships, with the involvement of partner entities with organizations representing the PIPCT. This will enable the presentation of proposals co-constructed in the selection of projects together with the Floresta+ Project and will guarantee trusting relationships between communities and institutions, solving the problem of lack of technical capacity in the administrative-financial area. In addition to promoting the cultural diversity of specific territories.

Importantly, this is the only Modality of the Floresta+ Amazônia Pilot Project that generated more perceptions of the Project's negative impacts, namely on indigenous peoples and on traditional peoples and communities. One of these negative impacts is that the participation of the PIPCT that the Project's governance fails to guarantee the comprehensive, autonomous and informed participation with equality of indigenous peoples and traditional communities, which can and should participate without the “tutelage” of third parties. This is a negative impact on the participation and autonomy of the PIPCT in the project, who does not want to be mere “receivers” of these projects.

There is a negative perception that the project has a unidirectional and vertical model, implemented by the Brazilian State to persuade and convince the PIPCT to adopt the ideas and points of view of being just a project with the purpose of commodifying forests. In the perceptions of representatives and leaders of the PIPCT, during the participatory workshops, this problem is accentuated if there is no commitment to carry out the consultations (Free, Prior and Informed Consent), since Decree No. 5051/2004 that promulgated the ILO Convention 169 has provisions that support these instruments.

As for the negative effects, it is verified in the context problems, that many of these collective territories, for the most part, are in rural areas. These areas are often difficult to access and lack means of communication, such as the internet. Thus, access to information and knowledge about the Floresta+ Amazônia Pilot Project is compromised. As mentioned in the participatory workshops, access to the internet and WhatsApp only works at municipal headquarters, and this fact may make it impossible to access the Call Notice and the mobilization of partner entities of these organizations.

Context problems may compromise the fulfillment of Modality 3's general objective, which is to support the implementation of projects aimed at strengthening environmental and territorial management, as there is a problem arising from the great diversity of beneficiaries in the Legal Amazon. For example, there are at least 430 indigenous lands in different stages of the process (337 indigenous lands are approved/regulated and 84 territories are in the process of demarcation), 960 quilombola territories in the process of land regularization by INCRA. The states of Maranhão and Pará stand out, which account for 83% of the total demand, with at least 300,000 people living in numerous traditional communities, claiming an estimated area of 21.8 million hectares, which will have difficulty in participating in the selection process for the 64 priority projects.

Another problem with the context problem is the lack of land tenure regularization in the traditionally occupied territories. In the Legal Amazon, non-certified indigenous lands (47 indigenous lands) are still in the study phase, with no estimate of territorial delimitation, located in the states of Amazonas, Mato Grosso and Pará. As for the quilombola communities of the total, 97.3% are in identification, only 2.7% were titled, a problematic issue faced by these communities is the slowness in completing their regularization processes, delaying the construction of collective projects and the promotion of ethnodevelopment in these territories. And the problem faced within the Conservation Units and the lack of a Management Plan that aims to meet the objectives established in its creation, among other actions as a prerequisite for the sustainable use of extractivist communities. It is observed that the problem is aggravated by the lack of environmental registration of the territories of usufructs of traditional peoples and communities. This is because the circumstances of the lack of land and environmental regularization increase the risks of violence, compromising the safety of these populations and violations of their territorial rights.

Another risk that is worth highlighting is the potential lack of commitment in the dialogue stages with PIPCT about potential PRs, priority areas and support needs, resulting in a great cultural impact due to the diversity of beneficiaries included in Modality 3. Other identified risks were the non-presentation of feasible proposals, since organizations may be poorly prepared for project management and, many of these organizations are in default situation and the probable requirement for applications from these organizations with the project can become a complex process.

Finally, mention should be made of the risk of how the monitoring mechanisms of the Floresta+ project will be, guaranteeing the beneficiary communities that they will act in a participatory manner, in addition to the fact that no instrument has guaranteed the continuity of the project in these territories.

6.3.4 Livelihoods

The Floresta+ Amazônia Pilot Project brings as a positive impact to traditional peoples and communities the possibility of partially meeting the need to implement new technologies that cover both the productive field and the process of preservation and control of deforestation in the territories of traditional and quilombolas communities.

The project will provide the possibility of implementing qualification courses for traditional populations, which can help improve the productive process and the well-being of the community, among which we can mention agroecological and organic production, quality courses in minimal processing agricultural products and plant extraction, forest fire control and monitoring of local deforestation, among the various areas of knowledge and according to the needs of the communities.

However, conflicts may be initiated or even intensified, because of what has already been mentioned regarding the overlapping of land owned by rural producers on land belonging to traditional populations, if there is no adequate control in validating the CAR in areas bordering the territories of the traditional populations.

Another aspect to be observed is related to the application of the resource, since within the community, project planning can more significantly benefit some families over others, generating conflict of interests and social divisions.

Another negative impact concerns the cultural impact of the “commodification of forests”, inducing a conflict between PES and the cultures of different peoples. Finally, an important negative impact is perceived by the Floresta+ Project's low recognition of the role of the PIPCT, promoting an inequality of resources between Modalities. This impact comes from the fact that the Floresta+ Project directs only 10% of the total funding directly to Modality 3. This weak financial support for this Modality turns out to be in line with recent results published by the Rainforest Foundation Norway report (RFN, 2021). Said report confirms that indigenous peoples, who protect some of the most important and critical forest ecosystems, conserve the richness of biodiversity and contribute to the world's carbon storage and climate balance, remain impaired in global funding for climate change mitigation, receiving less than 1% of international aid from donors and governments. The Report argues that decades of research and projects demonstrate that when these communities are

guaranteed rights to their land and can make collective choices about how to govern and use it, conservation outcomes tend to be better. However, conversely, they tend to be the most marginalized populations and peoples in green financing.

6.3.5 Biodiversity

The Floresta+ Communities modality has the general objective of supporting the implementation of local projects aimed at strengthening environmental and territorial management in the territories of indigenous peoples and traditional peoples and communities.

These local projects can cover several domains: environmental conservation actions, recovery of degraded areas, agro-ecological production, surveillance and territorial protection, etc.

Actions for environmental conservation and recovery of degraded areas will promote the conservation/recovery of areas with native vegetation, thus contributing to the Native Vegetation Protection Law. This aspect will have a positive impact on biodiversity as more area of habitat will be preserved/recovered. Projects related to surveillance and territorial protection may also contribute to this objective, as this will prevent/minimize illegal deforestation or even other types of activities that are harmful to the preservation of species, such as illegal hunting and fishing, for example.

Supporting these communities for agroecological production will also benefit the environmental quality of ecosystems and inherently the preservation of biodiversity, as pesticides will not be used in agricultural production, thus reducing the contamination of the food chain.

Similarly, the previous modalities, modality 3 also defines criteria for prioritizing local projects, and it is worth highlighting in the context of this evaluation the criteria for prioritizing regions. In this case, the criterion stands out of prioritizing projects, that being located in recognized collective territories or in sustainable use UCs in which local communities hold a Real Right of Use concession contract, are located in 'priority areas for biodiversity conservation,' sustainable use and benefit-sharing of Brazilian biodiversity or priority areas for biodiversity and restoration of native vegetation' (as per MMA Ordinance No. 463 of December 18, 2018). This criterion focuses on intervention in areas that are important for biodiversity, thus avoiding the dispersion of funds in less relevant areas, promoting a more consistent biodiversity protection policy. However, the fact that the continuity of the PES project is not guaranteed may pose a risk to the maintenance of some of the implemented projects.

6.3.6 Climate Change

Modality 3 is aimed at indigenous peoples and traditional peoples and communities residing in collective territories and aims to support the implementation of local projects aimed at strengthening environmental and territorial management.

The work areas eligible for support through Modality 3, described above, apart from the promotion of environmental conservation and the recovery of degraded areas, do not have a direct relationship with climate change. However, there does not seem to be any contradiction, even if apparent, between the eligible areas and the objectives of preventing climate change, both in terms of mitigation and adaptation.

Unlike Modalities 1 and 2, which have a territorial metric (hectares), Modality 3 aims to support at least 64 local projects, which prevents the development of carbon balance estimates resulting from the implementation of Modality 3.

In these circumstances, the potential impact of Modality 3: Communities in Climate Change is considered of indefinite magnitude, but with a positive trend. It is considered that there is a clear opportunity to enrich the consequences of implementing the Communities Modality, incorporating the theme of Climate Change in the scope covered by the Modality.

6.3.7 Impact Assessment

Modality 3 is characterized by presenting a certain balance between positive and negative effects, as can be seen in Table 6-8. The implementation of the Floresta+ Amazônia Pilot Project in Modality 3 is perceived as having a positive impact both for the communities and for the environment of their territories. Furthermore the project creates opportunities to establish partnerships between organizations, strengthen the PIPCTs and their representative entities, and promote cultural diversity in the territories.

On the other hand, the dialogue with the PIPCT may face problems arising from the great diversity of beneficiaries and for the establishment of priority areas. Another unfavorable risk may arise in the process of submitting proposals by organizations, as they may be poorly prepared for complex applications and may also be in default[99] with the rendering of accounts for previous projects and activities. In this modality, a certain negative effect is also observed since the continuation of the Floresta+ Amazônia Pilot Project is not foreseen.

Table 6-8. Analysis of the effects of the Floresta+ Amazônia Pilot Project according to the actions necessary for the operationalization of Modality 3.

	MODALITY 3 – Communities PHASES	Assessment	DT	TC	SE	BIO	MC
R	Dialogue with PIPCT on potential PRs, priority areas and support needs	Cultural impactGreat diversity of beneficiaries	X	X			
O	Pre-qualification ofResponsible Parties (PR)	Promotes the creation of partnerships between organizations	X	X			
C	Call Notice	Difficulty accessing the internet Lack of information	X	X			
C	Expression of interest forCSO/NGO	Difficulty accessing the internetLack of information		X			
O	CLPI process and detailing of local projects and their respective work plans	Strengthening of traditional communities. Strengthening of indigenous peoples. Strengthening ofrepresentative organizations. Strengthening of extractivism	X	X	X		
R	Presentation of proposals for local projects	Poorly prepared organizations. Application complexity	X	X			
O	Selection of local project proposals	Promotes cultural diversity in territories	X	X			
R	Establishment of contractual relationship	Non-fulfilment by organizations		X	X		
P	Implementation of local projects	Encourages the implementation of LPVN Promotes Environmental Services Promotes forest protection Improved quality of life. Promotes sustainable production Promotes security Strengthening women's movements	X	X		X	X
R	Monitoring	Need to establish in advance the monitoring mechanism of the Floresta+ project, guaranteeing thebeneficiary communities the knowledge of how the monitoring will take place.	X	X	X	X	X
R	Project continuity	Project continuity is not assured	X	X		X	X

[99] This question refers to the fiscal and administrative regularity of the organizations that could represent the communities to requestfinancing for projects in this modality. This is a concern that is frequently mentioned in the Participatory Workshops.

6.4 MODALITY 4: INNOVATION

Modality 4 will develop innovations that contribute to achieving the objectives of the Native Vegetation Protection Law and the National PES Policy (Law 14,119/2021). This Modality aims to promote the creation and consolidation of the environmental services market through the development of solutions and ventures, thus contributing to the conservation, recovery and sustainable use of native vegetation and to the generation of income for environmental service providers.

6.4.1 Perceptions

The interest groups perceptions regarding Modality 4, captured during the workshops, are generally characterized by possible positive impacts and some context problems, as can be seen in Table 6-9 and Table 6-10. Whereas the Floresta+ Project in this modality will guarantee an additional resource destined for innovation in the Legal Amazon and is understood as an important possibility of investment in innovation for the forest conservation sector.

Another positive impact should be the encouragement of partnerships between organizations and projects aimed at the collective good. The contextual problems highlighted concern the lack of a prior in-depth diagnosis of the gender focus in the region's innovation sector and the absence of assumptions linked to the circular economy and government food security policy.

Table 6-9. Positive effects of the Floresta+ Amazon Pilot Project: Modality 4.

Effect	MOD4	Description
Positive impact	Supports the introduction of new technologies	Introduces a budget to finance the development of innovationthrough studies and research. Solves problems and promotes basic services in communities insituations of greater vulnerability, improving their quality of life.
	Promotes the creation of partnerships between organizations	Favors the creation of partnerships between organizations/institutions to present collective projects.

Table 6-10. Negative effects of the Floresta+ Amazon Pilot Project: Modality 4.

Effect	MOD4	Description
Context problem	Responding to women's problems	There is a lack of gender action plan/map of existing gaps.
	Lack of reference to circular economy and local territorial development policies, income generation and food security	Lack of information on government support programs for farmers to push these policies forward.

6.4.2 Transversal Rights

In general, Modality 4 is positively evaluated as a possible driver of social and environmental improvements in the Legal Amazon, that is, it can help to promote human rights, gender equality and better labor conditions. The positive effects of Modality 4 of the Project, regarding the dimension "transversal rights", are linked to the opportunity to encourage partnerships between institutions of different natures for the development of innovative projects that benefit different peoples and local communities that make up Amazon's sociodiversity. Technological innovation projects to be financed by this modality may contribute to making the processes of conservation, use and management of forest resources more efficient and involving the different groups of potential beneficiaries of the Project.

Again, as in the other modalities evaluated, the difficulty of accessing information about government programs and other projects is considered a negative aspect resulting from existing context problems prior to the Floresta+ Amazônia Pilot Project. Two other issues presented as negative effects and which are also identified as context problems, about the themes of transversal rights, are: i) the need to promote policies for local territorial development, income generation and food security (considering this is a human rights issue) and ii)

the lack of a mapping that presents gender information in the institutional environment of technology and innovation to support a consistent action plan for gender equality in this scope.

6.4.3 Territories and Cultures

In Modality 4 there is a good opportunity for dialogue between entrepreneurs and technological developers and organizations from different groups of potential beneficiaries of the Project, which will enable these organizations to contribute their experiences and demands to the design of innovative technological solutions. As well, the Modality will be able to collaborate to give greater scale and replicability to local, community and ancestral technologies for other parts of the population of the Legal Amazon, generating an enriching exchange of replicable local good practices.

In a very specific field, it appears that it will be very useful for potential partners to also carry out innovation projects for the development of a monitoring mechanism, mediated by technology (digital or non-digital), making it possible to scale and interrelate risks in own dimensions of analysis of this study (transversal rights, territories and cultures, livelihoods, biodiversity and climate change) in the same integrated monitoring tool that remains after the implementation of the Floresta+ Pilot Project.

6.4.4 Livelihoods

Partnerships with public institutions such as universities, government agencies and technological entrepreneurs, in association with rural landowners, family farmers and PIPCTs holders of traditional knowledge associated with the conservation and sustainable use of natural resources may result in technological improvements in actions for the conservation and recovery of native vegetation.

A context problem identified is that many public managers, entrepreneurs or representatives of traditional communities have little knowledge, or are even unaware of the public policies that can serve to guarantee rights and generate income for potential beneficiaries of Floresta+. In this case, it is necessary for partner organizations to mobilize so that information reaches community managers and assists in engaging with socioeconomic strengthening programs such as those related to family farming and food security. This could be useful in encouraging circular economy as a way of generating income for traditional communities while complying with international sustainability protocols.

6.4.5 Biodiversity

The Floresta + Innovation modality, through the development of innovative solutions and new businesses related to the conservation, restoration and sustainable use of native vegetation will generate opportunities conducive to the preservation of Amazonian biodiversity.

Among the 4 modalities of Floresta +, this will be the modality with the least impact on biodiversity.

6.4.6 Climate Change

Modality 4 aims to promote the creation and consolidation of the environmental services market. This Modality will sponsor 20 projects to support the improvement and adoption of innovative instruments for public policies related to the conservation of native vegetation, through Payments for Environmental Services.

As in the case of Modality 3, it is not possible to develop estimates of the carbon balance resulting from the implementation of Modality 4. Also, in this case, there seems to be no contradiction, even if apparent, between the objectives and expected results with the Modality Innovation with the climate change prevention objectives, both in terms of mitigation and adaptation.

In these circumstances, the potential impact of Modality 4: Innovation in Climate Change of indefinite magnitude, but with a positive trend, is considered. It is considered that there is a clear opportunity to enrich

the consequences of the implementation of the Modality Innovation, incorporating the theme of Climate Change in the concerns covered by the Modality.

6.4.7 Impact Assessment

It should be noted that, in an integrated analysis of all Modalities of the Floresta+ Amazônia Pilot Project and given the fruitful discussion accumulated throughout the initial process of dialogue with stakeholders, Modality 4 may foster projects that support the implementation and monitoring of other modalities, at the same time that it can fulfill its previously established objectives, related to the innovative character and promotion of quality of life in the Legal Amazon through technologies, digital or not. It is notoriously a Modality with positive potential for opportunities.

Table 6-11. Analysis of the effects of the Floresta+ Amazônia Pilot Project according to the actions necessary for theoperationalization of Modality 4.

	MODALITY 4 Innovation - PHASES	Assessment	DT	TC	SE	BIO	MC
O	Dialogue with potential PRs and potential technical partners	Allows the knowledge of potentiallybeneficiary organizations and their experiences/good practices.	X	X		X	X
0	Selection of Responsible Parties (PR)	In the Project's governance process, itpromotes the participation of organizations.	X				
P	Presentation of proposals for Innovation Projects	Promotes the integration of organizationsthat own or develop innovations and technologies with the final recipients of their projects. It encourages partnerships between innovative organizations and the local community. Involve a diversified target audience, such as: Entrepreneurial companies (Startups); Cooperatives and associations of producers and extractivists;Private and public research and innovationinstitutions; NGOs/OSCs, with a focus on innovation.	X	X		X	X
O	Selection of innovation projectsproposals	Allows assessment of the innovativepotential of the proposals. Allows projects of this modality to be useful for the implementation of other Modalities.		X		X	X
O	Implementation/development of innovation projects	Encourages the implementation of technologies for forest conservation and recovery, that is, it relates to modalities 1and 2. Strengthens technologies that have alreadybeen used occasionally for territorial expansion of their use. Improved quality of life. Promotes sustainable production. Strengthening the participation of women in project teams and as project recipients. It encourages multiplication and exchange regarding innovative technologies.	X			X	X
O	Monitoring	Can foresee, among the innovation projects, the development of a monitoringmechanism mediated by digital or non- digital technology.	X	X	X	X	X

6.5 Update of the Risk Assessment

As described in subchapter 2.4, the Environmental and Social Impact Study started with a risk assessment (IDAD, 2021), which represented, in practice, a scoping process. This screening process, after collating UNDP's Social and Environmental Standards, Cancun Safeguards and the main standards – international and national – on the subject, determined that the Floresta+ Pilot Project includes activities with potential risks and adverse social and environmental impacts. The initial screening procedure identified 10 distinct risks (see Figure 2-1).

As explained in subchapter 4.3, after the readjustment of the risks that define the scope of this Social and Environmental Impact Assessment, a process of engagement of interested parties and possibly affected by the Floresta+ Pilot Project was developed. This engagement stage enabled the dialogue with academic and practical experts, who live and study the Legal Amazon, enriching the inputs for the assessment and study of impacts, as well as making the project known to these people and interest groups. Not all the risks that were listed in the initial assessment were directly referred to by participants during the stakeholder engagement process. There was no reference to the following risks (Figure 6-4):

- Economic displacement
- Displacement of carbon emissions and
- Labor conditions

However, the open dialogue methodology did not direct the target audience properly to an analysis of the risks, which was left to the experts, but to share:

- Their knowledge that helps to draw a social and environmental diagnosis of the Legal Amazon;
- Their perceptions about the payment for environmental services initiative and the specificities of the four modalities of the Pilot Project.

In this sense, it is not surprising that stakeholders are not objectively referring to all risks. The expert work developed later brought a complementary perspective that does not neglect the risks not mentioned by the interested parties. It was up to the expert team to relate all the risks to the issues that most specifically concern the population involved.

Based on the broad characterization of the baseline, presented in the previous chapter, and the assessment of environmental and social impacts just described, the concerns previously identified in the following risks are confirmed:

- Risk 1: Human rights
- Risk 2: Gender Equality
- Risk 3: Loss of access to natural resources
- Risk 6: Economic Displacement
- Risk 7: Cultural Heritage of Indigenous Peoples and Traditional Peoples and Communities
- Risk 9: Reversal of carbon stocks

As previously mentioned, it is essential to emphasize that the effects of the Floresta+ Amazônia Pilot Project, in the scope of the dimension called “Transversal Rights” is strongly related to those risks present in the “Territories and Cultures” and “Livelihoods” dimensions. Here, the impact assessment confirmed the pertinence of the risks described in the ESMF (IDAD, 2021) such as “Human Rights” (No.1), “Gender Equality” (No.2) and “Indigenous Peoples” (No.7).

The pre-existing land conflicts in the Legal Amazon, and the possibility of being exacerbated with the implementation of the Floresta+ Amazônia Pilot Project, can be interpreted as a combination of the risk “Access to Natural Resources” (No.3) and the risk “Economic Displacement” (No.6). Finally, the relevance of the “Reversal” risk (No.9) should be mentioned: the possibility of a reversal of the benefits obtained on carbon

stocks, if the Pilot Project does not continue, was mentioned horizontally throughout the participatory process. These are, therefore, the risks facing Floresta+ Amazônia. The Environmental and Social Management Plan must present mitigation, monitoring and, if necessary, capacity building and training measures.

At the current stage of knowledge, it is understood that it is correct to assume that the Floresta+ Pilot Project will not induce increased risks in the following topics that had been identified in the ESMF (IDAD. 2021):

- Risk 4: Impacts on natural habitats or protected areas
- Risk 5: Degradation of natural habitats
- Risk 8: Displacement of Carbon Emissions
- Risk 10: Labor conditions

On the contrary, and in the case of Risk 4, it is considered that the various Modalities of the Floresta+ Pilot Project represent, globally, an opportunity to achieve positive impacts, direct and indirect, on natural habitats and on protected areas. No negative risks to natural habitats or protected areas resulting from the conservation and recovery of native vegetation are foreseen.

The three remaining risks deserve a closer and more detailed reading. This group of risks encompasses very diversified topics, but which reflect the same perspective: the implementation of the Pilot Project does not increase the level of risk on these themes, but the context situation in each of these aspects is critical enough to represent itself a risk to the success of Floresta+ Amazônia. This characterization is valid for:

- the degradation of natural habitats (No.5) with a focus on the use of pesticides, resulting in potentially adverse effects on biodiversity, water and soil quality;
- the displacement of carbon emissions (No.8). The characterization presented on deforestation in other biomes in Brazil reveals that the deforestation process has moved from the Cerrado to the Amazon biome. It is not credible that the implementation of Floresta+ Amazônia will bring about a reversal of this process. Additionally, it was concluded that deforestation dynamics in Peru and Bolivia follow different dynamics, with no continuum with deforestation areas in Brazil;
- pre-existing labor conditions in the Legal Amazon, particularly in the agricultural-livestock sector, are often precarious, with situations close to slavery and involving child labor (increasing).

In these various cases, the emphasis of the management plan that will result from this process of assessing environmental and social impacts should be on monitoring, rather than mitigation, and eventually providing training and capacity building.

Figure 6-4 Qualification of environmental and social risks of the Floresta+ Amazônia Pilot Project after detailed characterization of the baseline, and assessment of environmental and social impacts. The various (10) types of risk are represented with the same chromatic nomenclature adopted throughout this chapter: Risk, Opportunity and Context Problem

7. Analysis of Alternatives

The UNDP technical team, in conjunction with the team responsible for preparing the Environmental and Social Impact Assessment Study (ESIA), and with the MMA technicians, developed an internal exercise to design alternatives to those previously defined in the Project's Operational Manual of the Floresta+ Amazônia Pilot Project. This initial exercise initially resulted in the development of a very wide range of alternatives, in a total of 21 suggestions. Both Modality 3, and the set of Modalities 1 and 2, were responsible for about 40% of these new working hypotheses.

In a more dedicated reading, a large part of this broad set of alternatives were interpreted more as recommendations to what was foreseen in the MOP than as being alternatives per se. Finally, the universe of alternatives to be considered in the ESIA was significantly reduced, after considering the feasibility and strategic relevance of each one of them.

Thus, and in addition to the zero alternative (absence of project), 5 alternatives will be considered for summary evaluation as listed in Table 7-1.

Table 7-1. Alternatives to the project for evaluation.

Alternative	Modalities	Current scenario	Description of alternative scenario
0	All	As described in the Project Operational Manual.	The Floresta+ Amazônia Pilot Project is not implemented. There is no place for financial support provided for Payment of Environmental Services.
1	M1 and M2	Efforts made to include all states inFloresta+, even those that do not meet priority criteria and are not making progress with the CAR analysis	Geographical coverage with greater spatialfocus. It is intended to reduce the geographic coverage, considering only the priority areas (according to the MOP priority criteria), using as a basis the map developed by the PMU. It isan alternative to the spatial coverage of the Pilot Project.
2	M1 and M2	Floresta+ Platform oriented to communication with beneficiariesand interconnection with other systems for automatic evaluation of criteria and adhesion of beneficiaries	Reorient the focus of the Floresta+ Platform to be a pilot project management system and a database of beneficiaries. In addition to supporting the states for the CAR team analysis, a team analysis for adherence to Floresta+ would also be carried out, with the verification of information and documents (environmental compliance, land tenure, among others) carried out by a company contracted by the project operating in the states. Interaction with potential beneficiaries will be done by persons contracted by UNDP who have contacted the beneficiaries. The datarequired for payment would be sent to the financial institution and published on the platform for transparency purposes. It is an alternative of technology and method.
3	M3	Implementation logic aimed at supporting projects by organizations of indigenous peoples and traditional peoplesand communities	Direct monetary payment to indigenous peoplesand traditional peoples and communities basedon results achieved in accordance with the objectives of the Communities modality. Implementation logic aimed at direct payment to individuals representing indigenous peoples and traditional peoples and communities. Project support would be terminated. Value-oriented alternative.
4	M2	Direct incentives to beneficiariesbased on area allocated for recovery of native vegetation	Additional support through basket of incentives(e.g. technical assistance and input financing to enable recovery beyond the direct incentives provided). Payment per area (hectare) remains unchanged: there is no additional payment, butdirect delivery of inputs (goods or technical assistance). Effects-oriented alternative
5	M4	Implementation occurs throughideation/hackathon events and incubation and acceleration programs	A new axis of action is included for the strengthening of innovation clusters in the Amazon. The modality adds exchange and integration activities between clusters for innovation in the Amazon and other more mature clusters in Brazil and other countries onthe challenges for conservation and sustainable development. Strategic alternative

Alternative 0 (all Modalities simultaneously): Floresta + Amazônia Pilot Project is not implemented

Alternative zero provides the frame of reference for the evaluation and is thus not a real alternative to the proposal, but a reference for evaluation. The real relevance of alternative zero is more apparent in the evaluation of an instrument with a more strategic character, providing alternative courses of action and where the prognosis of the continuation or cessation of a plan/program is crucial for the development of a strategy. In the present case, alternative zero describes what would happen, positively and negatively, the opportunities and risks that would arise, the costs and benefits resulting from the suspension, that is, the non-implementation of the Floresta+ Amazônia Pilot Project.

The evaluation methodology adopted in this case facilitates the perception of what would happen if Floresta+ Amazônia were not implemented. The impacts of implementation, both negative and positive, summarized in Table 6-5, Table 6-8 and Table 6-11 would not occur. It is important here, once again, to differentiate what are impacts, whether positive or negative (respectively, the benefits or damages promoted directly by the project) from the opportunities, risks and context problems that pre-existed the implementation of the project. In the absence of a Pilot Project, the context problems that condition its implementation would continue to exist and condition the socio-environmental reality of the territory of the Legal Amazon. As for the risks and opportunities, they would be canceled without intervention, which represents an inconsequential fact for the social and environmental context. The identification of risks and opportunities is aimed at identifying mitigation and strengthening measures, a process that would not be put into practice in the case of alternative zero.

The assessment must therefore focus on impacts. Based on the information collected and interpreted here, the suspension of the Floresta+ Amazônia Pilot Project would cause the following losses:

- Modality 1 Conservation and Modality 2 Recovery:
    - Elimination of an incentive to implement the Native Vegetation Protection Law.
    - There would be no promotion for:
        - expansion of the Legal Reserve area (Modality 1) or the recovery of the PermanentPreservation Area (Modality 2)
        - forest surveillance and protection.
        - family farming.
        - importance and enhancement of Environmental Services.
        - environmental awareness of beneficiary populations
    - Elimination of a contribution to climate stability and increased carbon sequestration capacity.
    - Failure to pay for environmental services performed would prevent the improvement of:
        - the socioeconomic conditions of family farmers.
        - quality of life.
    - The environmental conservation and recovery activity would no longer be financially valued.
- Modality 3 Communities:
    - Elimination of an incentive to implement the Native Vegetation Protection Law.
    - There would be no promotion of:
        - Environmental services
        - Forest protection
        - Sustainable production
        - Quality of life and safety of communities

        - Strengthening women's movements
- Modality 4 Innovation:
    - There would be no promotion of:
        - Integration of organizations that own or develop innovations and technologies withthe final recipients of their projects.
        - partnerships between innovative organizations and the local community.
        - Involvement of a diversified target audience focused on innovation, such as: entrepreneurial companies (startups), cooperatives and associations of producers and extractivists, private and public research and innovation institutions and NGOs/CSOs.

Given that the assessment of the environmental and social impacts of the Floresta+ Amazônia Pilot Project concluded that there were no negative impacts in the various analytical dimensions for any of the 4 Modalities, it is concluded that the non-implementation of the Pilot Project would not bring any benefit that could offset the losses listed above.

Alternative 1 (Modalities 1 and 2): Geographic coverage with greater focus

It is considered that the eventual reduction of the geographic coverage of the area of implementation of Modalities 1 and 2 would contribute to the anticipation and acceleration of the execution of the Floresta+ Amazônia Pilot Project. Overall, the adoption of this alternative would lead to an expansion of the positive effects of these two Modalities, especially about the dimensions of Livelihood and Biodiversity. In fact, the geographic concentration of the distribution of payments for environmental services would allow for the development of synergies between beneficiaries and the sharing of experiences, particularly relevant in the case of activities related to Modality 2: Recovery. The spatial concentration of modality 1 and 2 beneficiaries can also generate advantages of the “block” effect, that is, of forming continuous areas of legal reserves and APPs in closer recovery, or perhaps contiguous or at least interconnected. Thus, the spatial densification of an area with native forest would maximize the positive effects of the Pilot Project, in the conservation of nature and the enhancement of biodiversity, by minimizing the fragmentation of habitats and landscape.

Regarding Human Rights, and considering that the selection of priority geographic areas will naturally focus on states/municipalities with a more mature level of CAR implementation, it is concluded that this alternative should allow a minimization of land conflicts between rural landowners, as well as between these and the collective territories. In contrast, this alternative will lead to a smaller geographic distribution of benefits, leading to part of the territory of the Legal Amazon would be left out of the implementation of the Pilot Project, which may be seen, by some, as the establishment, and even extension, of an inequitable process of distributing financial benefits.

The attenuation of potential land conflicts, resulting from the application of Modalities 1 and 2 only in geographical areas with more mature CAR, also brings advantages for the dimension of Territories and Cultures. It is considered appropriate that the geographic concentration is limited to these two Modalities. The expansion of this assumption to the other Modalities would mean that a wide range of indigenous peoples and traditional peoples and communities distributed throughout the geographic territory of the Legal Amazon could be excluded from access to Modality 3 for reasons beyond these communities, which would represent an additional barrier to participation in the Pilot Project. As a positive effect, and if this geographic densification included the PIPCT, the possibility of maximizing the geographical and intercultural sharing of learning is identified.

Regarding Climate Change, the introduction of this alternative is indifferent as there is no change in the total areas subject to conservation and restoration.

It is considered that this is the scenario that tends to be the most likely, given the discrepancy in the development of CAR implementation among the states of the Legal Amazon, in addition to meeting the priority

criteria established in the approved Project itself. This option increases the need for, during the implementation of the Pilot Project, and especially at its end, to promote an interstate sharing of experiences and lessons learned.

Alternative 2 (Modalities 1 and 2): Refocusing the Floresta+ Platform

After a careful analysis of this alternative, it is considered that this work option represents, more than an alternative (this or that?), a measure to optimize the effectiveness of the Floresta+ Platform. The intention is to achieve the simplification of the Platform, enabling a contact with a lower degree of intervention by automatisms and computerized protocols, expanding human intervention, and achieving greater customization.

With this change, the Platform would no longer be the preferred means of interaction with beneficiaries, being just a platform that gathers the information necessary for the implementation of these Modalities, managing data and providing transparency to the Pilot Project. The interaction with the beneficiaries would be based on people hired for this purpose, who would approach and help (for example, through telephone contact) the potential beneficiaries.

This solution allows for a faster start-up of these two Modalities, which is considered positive for the dimension of Livelihoods. At the same time, by reducing the level of computer literacy required, it allows for greater equity of access to payment for Environmental Services, which is positive for the dimension of Human Rights.

The adoption of this option seems to be indifferent to the other assessment dimensions (TC, BIO and MC).

Alternative 3 (Modality 3): Direct monetary payment to indigenous peoples and traditional peoples and communities

The incorporation of this alternative for evaluation in the ESIA arises in response to several questions received in consultations about the difference in the methodology for distributing benefits between Modalities 1 and 2 (direct payment) and Modality 3 (indirect payment through projects).

For this payment a management scheme based on Performance Based Payment Agreements (PBPs)[100] would be adopted. UNDP has similar experiences in applying PBPs in Costa Rica and Indonesia. Performance-based payments (PBPs) are a type of agreement between UNDP and a responsible party to provide funding upon the verified achievement of a pre-agreed measurable development outcome. No advance payment is provided, instead payments are made only after verification of the agreed results. This approach gives greater encouragement to responsible parties to achieve results. A project that uses performance-based payments for selected outcomes may use additional agreements and methods to deliver other outcomes. The metric to be used in applying this option was not defined for the case of Floresta+ Amazônia.

One of the apparent advantages of this alternative will be to attribute an equality of approach to the beneficiaries of Modality 3: Communities with the beneficiaries of Modalities 1 and 2, which can be interpreted as an increase in the equity of the entire Floresta+ Amazônia Pilot Project. It should be noted here that this same equity could also be achieved, in the opposite sense, through the adoption of the payment for projects scheme for Conservation (Modality 1) and Recovery (Modality 2) activities, as proposed for Modality 3. In this new alternative, not considered, the projects could be developed by associations/organizations representing small rural landowners (family farmers).

The ESIA evaluation team does not support the recommendation of this scenario, as there is a possibility of causing greater social and cultural risks, glimpsed during the first dialogues carried out with the representative organizations in the ESIA construction process. It also goes against the general strategy of PNGATI and weakens the management plan for collective territories. There are previous experiences that individual payment generates conflicts between beneficiaries and non-beneficiaries of the same group/territory, posing an important risk to the integrity and sustainability of these groups.

[100] https://popp.undp.org/UNDP_POPP_DOCUMENT_LIBRARY/Public/PPM_Design_Performance- Based%20Payments.docx

The implementation, control and monitoring of these individual payments would represent greater difficulties and risks, sometimes even insurmountable, for a good part of the potential beneficiaries, due to situations such as those that result in very low banking levels among individuals in the PIPCTs. For most PIPCTs in their territories, the distances and precarious means of mobility and access to payment sites represent an individual and collective cost that would cancel out a good part of the pecuniary benefits of payment in this modality. Depending on who is the beneficiary of the benefit, and when the man presents himself as the head of the domestic group, women, the elderly and children run the risk of being excluded from the usufruct of this payment.

Thus, this alternative, when compared to the original proposal for Modality 3 of the Floresta+ Pilot Project, significantly amplifies the risks and impacts on the dimensions of Human Rights, as well as Territories and Cultures. At first reading, no benefits are foreseen in the other dimensions (SE, BIO and MC) that could positively offset the increased level of risk.

The eventual adoption of this alternative would represent a profound change to Modality 3, violating the principles that led to its original design. In addition to the cultural impacts it could cause, and the accentuation of a possible perception of the commodification of nature, the acceptance of this new version of Modality 3 would necessarily require the resumption of dialogue with the PIPCT, which could represent an irreparable delay in the implementation of the Floresta+ Amazônia Pilot Project.

Alternative 4 (Modality 2): Additional support through an incentive basket

It is important to note that alternative 4 applies only to Modality 2: Recovery. In other words, this alternative has no consequences for Modality 1: Conservation. This alternative is intended to respond to the possible low interest of potential beneficiaries in applying for Modality 2, if they consider the value proposed for payment to be low. This situation, if it occurs, may, in the current scenario, compromise the achievement of the project's goal and the objectives of Modality 2. With this option, in addition to the direct payment of R$ 150.00/ha, there would be an additional contribution through direct delivery of other inputs such as goods (fences, seed bank, etc.) and/or technical assistance directly applicable in the APP recovery activity.

This alternative makes Modality 2 more attractive, which can expand its implementation and translate into greater direct positive effects of the Pilot Project in the Livelihoods dimension. The transfer of knowledge achieved with technical assistance ensures greater technical competence to Recovery activities and will prolong and consolidate their effectiveness. In this perspective, it is considered to have a positive effect on the Biodiversity and Climate Change dimensions.

The implementation of this alternative has zero consequences about the dimensions of Human Rights and Territories and Cultures.

Its implementation could make the management and logistics of payment execution in these formats excessively complex. It should be noted that it follows a logic and operational mode like the current rural technical assistance model.

Probably, the offer of the basket of incentives would imply the allocation of more financial resources for Modality 2. This objective could be achieved in a simpler way by increasing the value of the individual payment per hectare and covering the costs of the Recovery in a greater percentage.

Alternative 5 (Modality 4): Amazon innovation clusters

It is considered that in this case it is not a real programming alternative, but the inclusion in Modality 4 of yet another axis of action aimed at strengthening the innovation clusters in the Amazon.

It is unquestionable that the promotion of exchange should positively strengthen local organizations. However, the allocation of resources to one more axis (exchange) means reducing the costs of other actions already foreseen in the Project.

The support of "ready-made solutions" that do not encourage the development of biomes and groups in the region and that are not fully aligned with the objectives of the Floresta+ Amazônia Pilot Project should be avoided.

From an impact assessment point of view, this alternative does not bring new visions and perspectives to the assessment developed throughout the ESIA. Roughly speaking, the strengthening of innovation structures in the Amazon is considered an important contribution to sustainability and to the continuity of payment for environmental services.

8. Mitigation Measures

As a complement to this ESIA, an Environmental and Social Management Plan (ESMP) was developed, which, given the characteristics of the risks involved in the Pilot Project, is subdivided into general management plans and specific thematic plans.

According to the strategic objectives of the consulting team, set out in subchapter 4.2, the Environmental and Social Management Plan (ESMP) with all its components intends to: i) enhance the payment for environmental services – which takes place in Modalities 1 and 2; ii) increase the socio-ecological resilience of communities – mainly through projects to be financed under Modality 3 and, in part, under Modality 4; and iii) to ensure, in general, that the implementation of the Floresta+ Amazônia Pilot Project takes place without increasing context problems related to pre-existing political and social conflicts.

In line with the conclusions set out in subchapter 6.5, the ESMP will present mitigation measures, monitoring and capacity building and training for the risks of Human Rights (No.1), Gender (In)Equality (No.2), Access to natural resources (No.3), Economic Displacement (No.6), to Cultural Heritage of Indigenous Peoples and Traditional Communities (No.7) and Reversal of Carbon Stock (No.9); measures that enhance the opportunities that benefit natural habitats (No.4); and, measures that consider the context problems related to the Displacement of carbon emissions (No.8) and Labor conditions (No.10). For opportunities and context problems, the proposed lines of action are fundamentally Monitoring, Training and Capacity Building.

Figure 8-1 demonstrates the approach that will be adopted to prepare the Social and Environmental Management Plan in accordance with the assessment of each risk addressed.

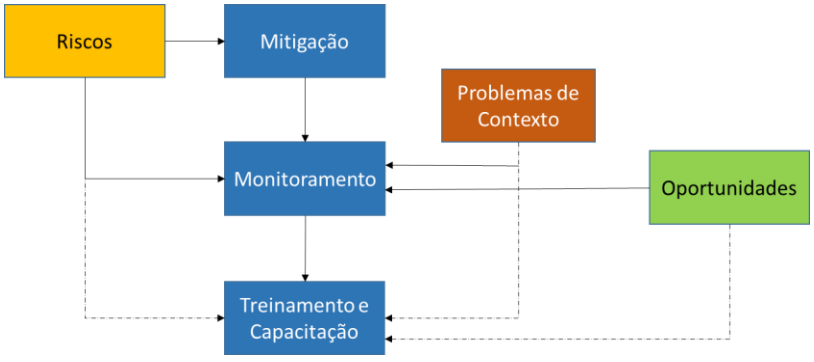


Figure 8-1 Flowchart for addressing, in the Social and Environmental Management Plan, the identified social and environmental risks and impacts.

The Environmental and Social Management Plan will include measures applicable to the Pilot Project as a whole, only to Modalities 1 and 2 together, Modality 3 and Modality 4; in a methodology analogous to that used in Chapter 6 to structure the evaluation of the effects of the Floresta+ Pilot Project. With the difference that Risks 2 and 7 will have specific thematic Plans.

The ESMP is organized into the following management documents:

- General Environmental and Social Management Plans
  - Mitigation Plan

- Monitoring Plan
- Capacity Building and Training Plan
- Complaints Resolution Mechanisms

- Thematic Plans
  - Indigenous Peoples and Traditional Peoples and Communities Plan
  - Plan for Gender Equality
  - Stakeholder Engagement Plan

The structure of the General Environmental and Social Management Plan follows the following index:

- Mitigation Plan: The risk mitigation component of the ESMP should include significant measures to strengthen the institutional and governance capacity of the organizations involved in Modalities 3 and4, organizations representing the potential beneficiaries of Modalities 1 and 2, government agencies (of the three federative spheres) involved in the implementation of the Pilot Project.

  Furthermore, the Mitigation Plan may highlight important thematic lines to be highlighted in the financing notices. Regarding the articulation between Modalities, initiatives are suggested in Modalities 3 and 4 that corroborate to also strengthen the activities of beneficiaries in Modalities 1 and2, such as, for example, developing certification of agroecological or agro-sustainable products and implementing improvements in distribution and distribution chains for these products.
- It will also be opportune for the Mitigation Plan to present strategies aimed at the continuity of the Project, strengthening the resilience and sustainability of the PIPCT; the generation of employment and income in the other modalities.
- Monitoring Plan: As part of the Monitoring Plan, a set of initiatives will be established that will make it possible to monitor both the mitigation of impacts and the implementation of the Pilot Project. It should be noted that in the case of context problems, raised in the evaluation process, the contexts themselves will be monitored so that they do not harm the Project and its beneficiaries. As, for example, labor conditions can be monitored to prevent degrading labor conditions, slave labor and child labor in the territories involved in the Project from occurring on the beneficiary properties.
- Qualification and Training Plan: It will consist of activities related to the most critical topics among the risks raised. Initially suggesting training related to administrative, accounting and legal issues for the regularization of organizations that may be in default or with other outstanding issues that make it impossible for them to be beneficiaries in Modality 3.
- Complaints Resolution Mechanism(s) (Ombudsman): A proposal will be presented for integrated mechanisms to receive, process, respond to and resolve complaints from the most diverse Project actors and regarding different risks. It may be constituted by a kind of Ombudsman, which must be accessible to everyone on an equal basis.

The Thematic Plans meet the following requirements:

- PIPCT Plan: The specific thematic Plan aimed at Indigenous Peoples and Traditional Peoples and Communities, namely the target audience of Modality 3 of the Pilot Project, addresses the most critical issues regarding forest maintenance in the territories of these populations, at the same time as guaranteeing them a better quality of life and territorial and food security. The Free, Participated and Informed Consultation (FPIC) and other principles established in Convention No. 169 ILO will always be considered, as well as in the other normative instruments already mentioned in this report.
- Gender Equality Plan: The Gender Equality Plan foresees how the Floresta+ Amazônia Pilot

Project can focus on promoting gender equality in all modalities and stages of the project. Thus, this document will present strategies to ensure that there is no maintenance or reproduction of structural gender inequalities present in the Brazilian Amazon region, always promoting female protagonism in decision- making in matters that affect women of any age and sociocultural condition. The Plan must be articulated with others, insofar as, for example, gender issues depend on the permanent collection and analysis of data, which may be foreseen among the indicators of the Monitoring Plan.

- Stakeholders Engagement Plan: The Stakeholders Engagement Plan and the PIPCT Plan must be articulated to guarantee the conditions of Free, Prior and Informed Consent (CLPI) whenever applicable, in all phases of Modality 3, as applicable for Modalities 1, 2 and 4. Consequently, a space for the exchange of knowledge of the PIPCT can be implemented for the other actors of the Pilot Project, whether potential beneficiaries or agents of all the organizations involved (such as the UNDP, MMA, organizations potential beneficiaries in Modality 4, among others).

  Another strategy to be used in the Engagement Plan is to involve public bodies in the implementation process, so that the Floresta+ Amazônia Pilot Project can influence some continuity of the PES (Modalities 1 and 2) of projects with PIPCT (Mode 3) and innovation projects (Mode 4) with methodologies for scaling up best practices and, in the future, even consolidating an improved public policy.

  This plan may also be useful to raise the themes and issues that should be a priority in the Capacity Building and Training Plan (integrated in the Environmental and Social Management Plan)

9. CONCLUSIONS AND RECOMENDATIONS

This document is the final version of the document that reports on the Environmental and Social Impact Assessment process of the Floresta+ Amazônia Pilot Project.

The dimensions of analysis on which the study is structured are based on a prior assessment of environmental and social risks that confronts the UNDP's environmental and social principles. During the period from the start of the study to the present time, the team of consultants promoted a broad debate and knowledge sharing with stakeholders through initial dialogues with representative organizations, the promotion of preparatory webinars covering the 9 States from the Legal Amazon and, finally, through the organization of intense participatory workshops aimed at specific interest groups. This engagement process made it possible to measure and refine the evaluation dimensions. The report includes a complete and updated description of these dimensions, enabling the definition of the baselines on which the Floresta+ Amazônia Pilot Project will take place.

With the information and knowledge gathered, it is possible to present an approach to the environmental and social impacts that are expected to happen with the implementation of Floresta+ Amazônia.

One of the most important findings is that the Floresta+ Pilot Project has a preponderance of positive social and environmental impacts. The negative effects, that is, the negative consequences resulting from the project's implementation, are practically non-existent. However, it is advisable not to neglect a wide range of risks and context problems that have been identified and that may affect, or even put into question, the expected success with the project's implementation.

The positive impacts are a direct result of the objectives of the Floresta+ Amazônia Pilot Project: encouraging the implementation of the Law for the Protection of Native Vegetation, the promotion of environmental services, the emergence of a new form of income, the improvement of the quality of life of the beneficiaries or, among other positive effects, the contribution to climate stability. In short, keep “the forest standing”. These positive impacts can be considered as being transversal to the various Modalities of the project.

As mentioned above, despite some negative perceptions, the expert assessment suggests that the Floresta+ Pilot Project should not directly induce the occurrence of damage. However, the study carried out identified, on the one hand, risks inherent to the implementation of the Pilot Project, that is, Floresta+ fosters favorable circumstances for the occurrence of possible future damages and, on the other hand, the existence of pre-existing situations, situations of context, independent of the project, which may affect the implementation of Floresta+ Amazônia and/or the fulfillment of its objectives and goals.

Briefly, it is worth highlighting some critical points. At the base of the implementation of Modalities 1 and 2 is the Rural Environmental Registry (CAR). The status of the CAR, in particular the numbers of CAR validated, show a huge gap between the number of processes actually validated and the objectives of the Pilot Project. Additionally, difficulties in accessing information and the internet were identified by a significant part of the beneficiaries of these two Modalities, which could prevent many of the potential interested parties from participating in Floresta+. When adopting payment policies for environmental services, it is important to ensure the continuity of these same services; the Floresta+ Pilot Project should reflect on this problem as, otherwise, there may be a reversal of the environmental benefits at the end of the project. Finally, it should be noted that the financial value referred to the payment for environmental services may be insufficient to stimulate the interest of small rural producers and family farmers. This situation should be particularly critical for Modality 2 – Recovery.

In the case of Modality 3 – Communities, the default situation of many organizations representing the PIPCT was identified as critical, which could lead to the exclusion of organizations legitimately interested in participating in this process. The risk of this initiative was also identified to exacerbate existing land conflicts in the complex socio-ecosystem of the Legal Amazon. It will be essential to incorporate indigenous and traditional knowledge in defining the project's objectives.

A final concern that is worth mentioning is the risk of falling into a complex and bureaucratic process that will alienate many of the potential beneficiaries. Thus, it will be essential to create, in a relatively short space of time, an agile and flexible management structure to manage the financial support and monitoring of the approximately 80,000 beneficiaries foreseen for Modalities 1 and 2, the 64 projects to support indigenous peoples and traditional peoples and communities (Modality 3), and 20 projects to support the improvement and adoption of innovative instruments for public policies related to the conservation and recovery of forests (Modality 4).

This study evaluates, in addition to alternative zero, a set of 5 programmatic alternatives. From the evaluation made to alternative zero, it was concluded that it is important to create the conditions required for the implementation of the Floresta+ Pilot Project. Its non-implementation would represent the loss of a wide range of social and environmental benefits and would not bring any new compensation.

Of the alternatives analyzed, it is interesting to mention as very interesting the possibility of reducing the geographic coverage of the beneficiaries of Modalities 1 and 2, which would allow accelerating the implementation of the Floresta+ Amazônia Pilot Project. In the opposite direction, there is the possibility of in Modality 3 making a direct monetary payment to the PIPCT, which was considered as an undesirable expansion of the risk levels associated with the implementation of this Modality.

Finally, it should be noted that the assessment exercise of the environmental and social impacts of the Floresta+ Amazônia Pilot Project resulted in the identification of a set of mitigation and enhancement measures, monitoring actions and capacity building and training initiatives. All of this is brought together in the Environmental and Social Management Plan (ESMP), an autonomous document, but which should be considered as an integral part of the process of assessing environmental and social impacts.

The ESMP is organized into the following documents:

- General Environmental and Social Management Plans
    - Mitigation Plan
    - Monitoring Plan
    - Capacity Building and Training Plan
    - Complaints Resolution Mechanisms
- Thematic Plans
    - Indigenous Peoples and Traditional Peoples and Communities Plan
    - Plan for Gender Equality
    - Stakeholder Engagement Plan.

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