REDD+

And the new **market**

of corbon in Brazil

A starter guide for interested communities

Instituto
Fronteiras

International Cataloging in Publication Data (CZP) (Câmara brasileira do livro, sP, brazil)

REDD+ and the new carbon market in Brazil
)electronic book] : a starter guide to
interesting communications / Karla
Sessin-Dilascio...)et al.]. --
cruzeiro o Sul, Ac : Instituto Fronteiras, 2025.
PDF

other authors: charles Borges-Rossi, Fiama
Natacha Lima e oliveira, Paulo Sinisgalli.
Biography.
ISBN e78-65-ee3e2e-4-8

1. Environmental degradation 2. Deforestation
3. Emissions and greenhouse gases 4. Governance
5. Environment - conservation and protection 6. Trade
emissions and carbon 7. Reduction and Emissions
from Deforestation and Forest Degradation (REDD)
I. Sessin-Dilascio, Karla. II. Borges-Rossi, charles.
III. oliveira, Fiama Natacha Lima e. IV. Sinisgalli, Paulo.

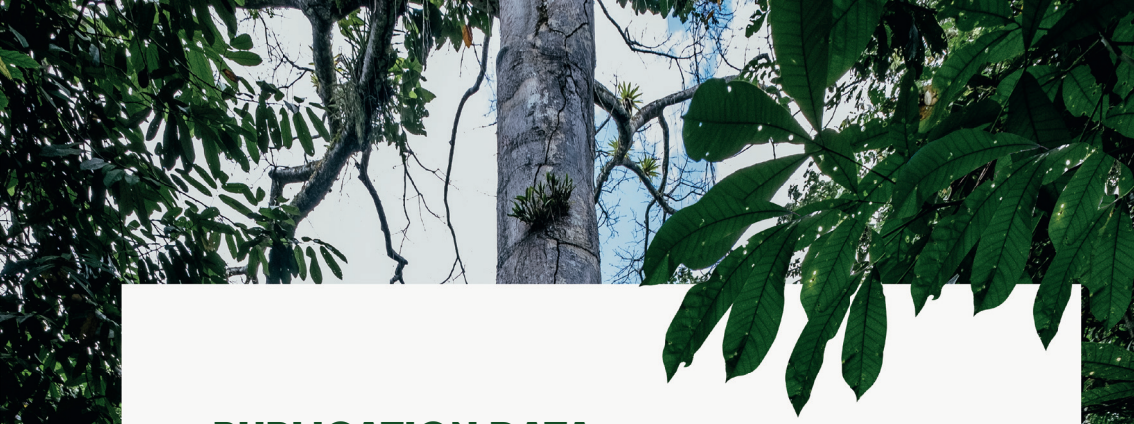
25-25e114 cDD-363.73874526

indexes for systematic catalog:

1. credit and carbon : climate change : social
problems 363.73874526

Eliane e Freitas Leite - Biographer - cRB 8/8415

DOI: 10.5281/zenodo.15058497



PUBLICATION DATA

AUTHOR

Karla Sessin-Dilascio, Charles Borges-Rossi,
Fiama Natacha Lima de Oliveira,
Paulo Sinisgalli

LAYOUT/ILLUSTRATION

Raissa Grego

REVIEW

Charles Borges-Rossi

SUPPORT

WORLD RESOURCES INSTITUTE

Overseas Resources Foundation LTD.

PARTNERS

GLOBAL PARTNERSHIP FOR SOCIAL ACCOUNTABILITY

SSN TOWARDS CLIMATE RESILIENCE

HUAIROU COMMISSION
Women, Homes & Community

International Cataloging in Publication Data (CZP) (Câmara brasileira do livro, sP, brazil)

REDD+and the new carbon market in Brazil)electronic book] : a starter guide to interesting communications / Karla Sessin-Dilascio...)et al.]. -- cruzeiro o Sul, Ac : Instituto Fronteiras , 2025. PDF

other authors: charles Borges-Rossi, Fiama Natacha Lima e oliveira, Paulo Sinisgalli.
Bi ography.
ISBN e78-65-ee3e2e-4-8

1. Environmental degradation 2. Deforestation 3. Emissions and greenhouse gases 4. Governance 5. Environment - conservation and protection 6. Trade emissions and carbon 7. Reduction and Emissions from Deforestation and Forest Degradation (REDD) I. Sessin-Dilascio, Karla. II. Borges-Rossi, charl es. III. oliveira, Fiama Natacha Lima e. IV. Sinisgalli, Paul o.

25-25e114 cDD-363. 73874526

indexes for systematic catalog:

1. credit and carbon : climate change : social problems 363. 73874526

Eliane e Freitas Leite - Biographer - cRB 8/8415

DOI: 10.5281/zenodo.15058497

DOI: 10.5281/zenodo.15058497

SUMMARY

FIIGURES

FRAMES

LISTA DE SIGLAS

1 tCO2e	One ton of carbon dioxide equivalent
AFOLU	AgricultureForestry and Other Land Uses
APD	Avoiding Planned Deforestation - Avoided Deforestation and Planned Forest Degradation Projects
ART	Architecture for REDD+ Transactions
AUD	Avoiding Unplanned Deforestation Projects
BAU	Business-as-usual
BMZ	Ministry for Economic Cooperation and Development of the Government of the Federal Republic of Germany
BNDES	National Bank for Economic and Social Development
CBE	Brazilian Emissions Quota
CCB	VERRA's Climate, Community and Biodiversity Standard.
CCBA	Climate, Community and Biodiversity Alliance
CfRN	Coalition of Rainforest Nations
CH4	Methane gas
CO2	Carbon dioxide
Coalizão Leaf	Lowering Emissions by Accelerating Forest Finance - Reducing Emissions by Accelerating Forest Finance
CONAREDD+	National REDD+ Council
COP	Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC).
CPLI	Prior, Free and Informed Consultation

CRVE	Certificate of Verified Emission Reduction or Removal
ENREDD+	National REDD+ Strategy
EOI	Expression of Interest - Expression of Interest
ERPA	Emission Reductions Purchase Agreement
FREL	Forestry Emissions Reference Level
FUNAI	National Foundation for Indigenous Peoples
GEE	Greenhouse Gases
H2O	Water
HFLD	Methodology High-Forest/Low-Deforestation
IMC	Acre State Institute for Climate Change and Regulation Environmental Services
INPE	National Institute for Space Research
IPAM	Amazon Environmental Research Institute
ISO	International Organization for Standardization
ITMO	Internationally Transferred Mitigation Outcomes
MRV	Monitoring, Report and Verification
N2O	Nitrogen oxide
NDC	Nationally Determined Contributions.
OIT	International Labor Organization, a United Nations agency that promotes access to decent work in its member countries.
PERNM	State REDD+ Programs Non-Market Approach
PJRM	Jurisdictional carbon credit projects/programs "REDD+ market approach"
PNMC	National Policy on Climate Change

PPCDAm	Action Plan for the Prevention and Control of Deforestation in the Legal Amazon
PPRM	Private "REDD+ market approach" carbon credit projects
PRODES	Brazilian Amazon Forest Satellite Monitoring Program
PSA	Payment for Environmental Services
RED	Reducing Emissions from Avoided Deforestation
REDD+	Reducing Emissions from Deforestation and Forest Degradation
REM/AC	Acre State Program of the REDD+ for Early Movers approach
SBCE	Brazilian Greenhouse Gas Emissions Trading System
SDM	Sustainable Development Mechanism
SISA	Environmental Services Incentives System
SISREDD+	Safeguards Information System REDD+
TREES	Environmental Excellence Standard
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verifiable Carbon Standard
VCU	Verified Carbon Unity - Verifiable Carbon Unity

INTRODUCTION

This booklet organizes the most relevant information on REDD+ (Reducing Emissions from Deforestation and Forest Degradation) initiatives in Brazil, covering their origins, mechanisms and institutional arrangements in the contemporary context. Designed as a quick reference guide for those interested in these initiatives, the material starts with the basic concepts REDD+, carbon credits, the greenhouse effect and climate change to explore the types of projects and programs within the REDD+ architecture led by governments (state) and the private sector (non-state), detailing their certification processes, the role of the organizations involved and their respective certification standards. It also deals with the fundamental criteria considered in the process of generating and certifying carbon credits, such as proving additionality, subtracting double-counting, taking leakage into account and guaranteeing permanence. The guide also highlights the mechanisms that seek to promote socio-environmental justice in these initiatives, discussing the Cancun safeguards, the principles for Free, Prior and Informed Consultation (FPIC) and the principles of benefit sharing. It also addresses the concepts and institutes of the new Carbon Market Law (La No. 15.042/2024), describing how the new legislation changes the institutional environment of REDD+ in Brazil by structuring new possibilities for arrangements within the mechanism's architecture. With this report, we hope to contribute to the various stakeholders interested in greater transparency and effectiveness of these initiatives, as well as guaranteeing the rights of the communities involved in REDD+ projects in the country.

1. WHAT IS REDD+

REDD+ is an acronym for Reducing Emissions from Deforestation and Forest Degradation and other sustainable forest management activities (Figure 1). REDD+ is a mechanism that arose from the articulation of countries from the Global South interested in including the maintenance of their tropical forests as part of the mechanism for compensating and mitigating climate change, partly reversing the injustices caused by not recognizing the socio-economic value of the ecosystem services they provide. REDD+ is therefore a mechanism for paying for environmental services (PES) provided by tropical countries which, by keeping their forests standing, are contributing to reducing greenhouse gas emissions and intensifying climate change.

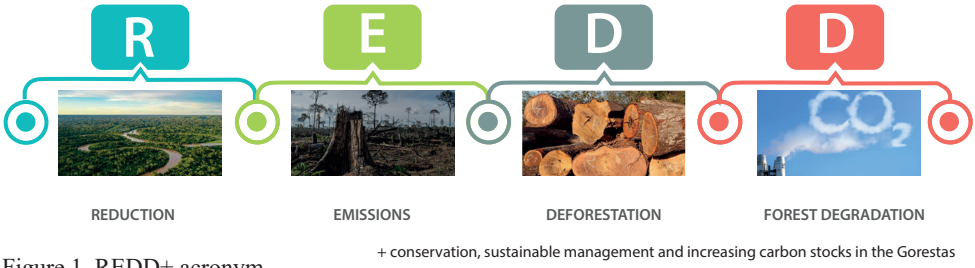


Figure 1. REDD+ acronym.
Source: Instituto Fronteiras (2024).

2. HISTORY OF THE CREATION OF REDD+

REDD+ is the result of several rounds of international negotiations involving countries interested in assigning economic value to the process

to maintain their forests standing, which culminated in the agreements reached at the Conferences of the Parties (COPs) under the Convention. -The United Nations Framework Convention on Climate Change (UNFCCC), or simply the Climate Convention. In 2005, during the 11th Conference of the Parties (COP11) in Montreal, Canada, the countries united in the Coalition of Rainforest Nations (CfRN)[1], including Brazil, proposed reducing emissions through avoided deforestation (RED) as a mechanism for paying for the environmental services provided by these countries in maintaining their forests. Subsequently, as the negotiations evolved and those involved gaineda greater understanding of the factors that contribute to these desired reductions, RED incorporated new activities associated with keeping the forest standing, culminating in the creation of the acronym REDD+ at COP 15 in Copenhagen in 2009. Figure 2 shows the timeline of the REDD+ negotiations at the UN Climate Change Conference.

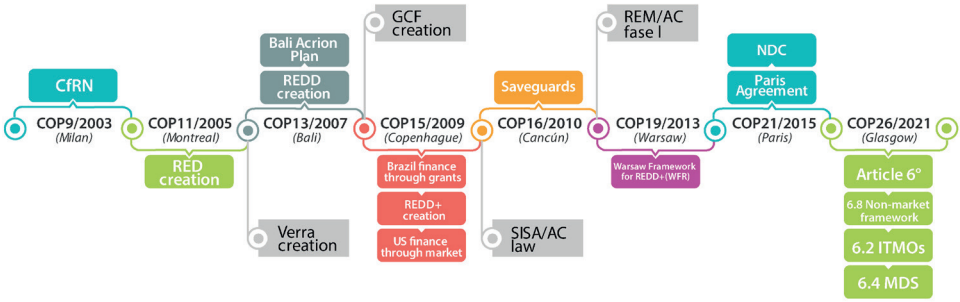


Figure 2: Timeline of REDD+ negotiations at the Climate Change Conference. Source: Our translation (SESSIN-DILASCIO; BORGES-ROSSI; SINISGALLI, 2024).

[1] See Coalition for Rainforest Nations (CfRN) created at COP 3 in Milan. and SESSIN-DILASCIO, Karla; BORGESROSSI, Charles; SINISGALLI, Paulo. Discovering REDD Plus in Brazil. Sustainability, v. 16, n. 13, p. 5409, 2024.

During these negotiations, the Brazilian government's understanding of the growing demand in the international market for economic mechanisms to offset GHG emissions was that, considering that most of these emissions in Brazil came from land use change, through deforestation, burning and agricultural expansion (75%)[2], and since 58.5% of the national territory is covered by forests (SFB, 2018)[3], the country could benefit significantly from an economic point of view if REDD+ were consolidated as an incentive and financial compensation mechanism for maintaining standing forests that could be financed by the largest countries emitting these gases.

However, this strategy has not evolved as expected due to the resistance of the major emitting countries to recognizing this mechanism for this purpose. Thus, as the signatory countries to the Climate Convention were unable to sign agreements that considered REDD+ as a mechanism for GHG compensation, interested countries such as Brazil contributed to the parallel development REDD+ in relation to the climate negotiations. Here, this process began with the creation of the Amazon Fund in 2008, financed by a jurisdictional REDD+ mechanism managed by the National Bank for Economic and Social Development (BNDES), based on an initial financial contribution from the Norwegian government in 2009, in the amount of approximately US$ 110 million, as payment for the results obtained in reducing deforestation in the country between 2006 and 2008[4].

[2] See TSAI, Davi et al. Analysis of Greenhouse Gas Emissions and Their Implications for Brazil's Climate Goals 1970-2022. System for Estimating Greenhouse Gas Emissions and Removals (SEEG), Piracicaba, Brazil, 2023.

[3] See BRAZIL. Brazilian Forestry Service. The biomes and their forests . Available at: https://snif.florestal.gov.br/enbr/os-biomas-e-suas-florestas . Accessed on: 13 feb.

[4] See CORREA, Juliano; VAN DER HOFF, Richard; RAJÃO, Raoni. Amazon Fund 10 years later: lessons from the world's largest REDD+ program. Forests, v. 10, n. 3, p. 272, 2019.

Next, the creation of the National Climate Change Policy (PNMC - Law No. 12.187/2009) reinforced the country's commitment to reducing GHG emissions by creating the Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAm) and the ABC Plan (Low Carbon Agriculture). These have become important public policy instruments aimed at reducing emissions from deforestation, degradation and fires, based on robust evidence produced by advanced emissions measurement technologies within the scope of the National Institute for Space Research's Brazilian Amazon Forest Satellite Monitoring Program, PRODES/INPE. These instruments have increased the reliability of Brazil's Forest Reference Emission Level (FREL)[5] , creating an environment of confidence in the additionality of state REDD+ projects, payments by results and trust in Monitoring, Reporting and Verification (MRV) mechanisms (see Box 2).

In 2015, with the Paris Agreement signed at COP21, the scenario for REDD+ began to look more favorable. Based on this agreement, countries can propose voluntary targets for reducing GHG emissions, which are now called Nationally Determined Contributions (NDC). Brazil's NDCs had the commitment to reduce GHG emissions by 37% by 2025, with a subsequent indicative contribution of a reduction of up to 43% by 2030, always in relation to the levels of emissions estimated for 20056.2030 sempre em relação aos níveis de emissões estimados para 2005[6].

[5] Brazil submitted its FREL to the UNFCCC for the first time in 2014.

[6] See BRAZIL. Ministry of Science, Technology, Innovation and Communications (MCTIC). Secretariat for Research and Development Policies and Programs (SEPED). General Climate Coordination (CGCL). SEPED/MCTI Ordinance No. 3, of February 10, 2015. Available at: https://antigo.mctic.gov.br/mctic/opencms/legislacao/portarias/migracao/Portaria_SEPEDMCTI_n_3_de_10022015.html . Acesso em: 13 fev. 2025.

The signing of the Paris Agreement and the discussion of its Article 6[7] pointed to the creation of a new regulated international carbon market. However, it would still be necessary to overcome political difficulties and technical bottlenecks[8] for its effective implementation. Faced with this delay along the path of the regulated market, private agents took the initiative by creating private REDD+ projects throughout Brazil in the hope of getting ahead in the process of generating carbon credits. , we have identified 92 such projects, as shown in Figure 3.

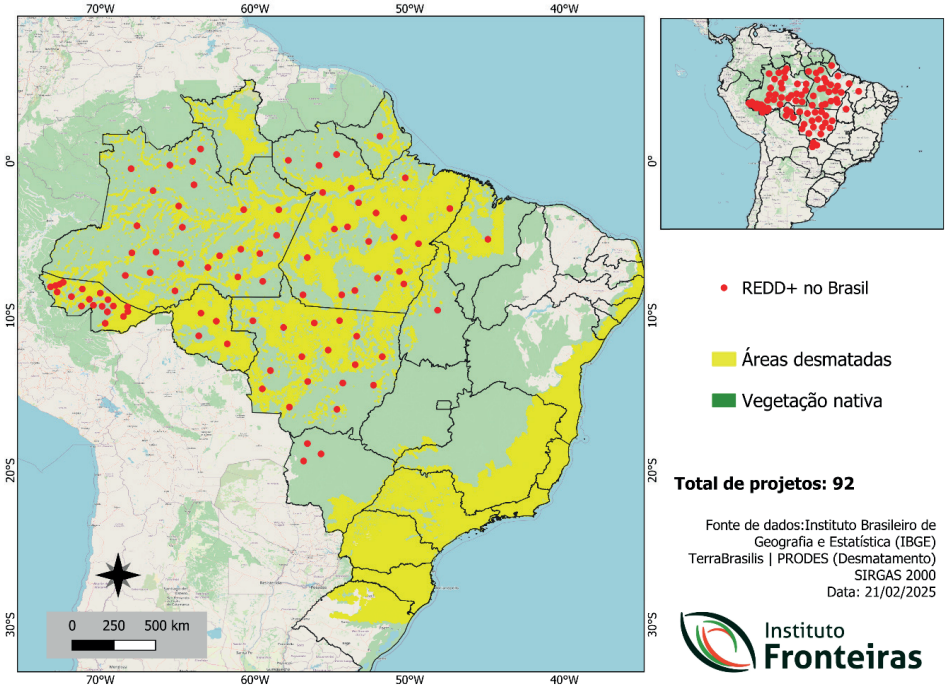


Figure 3: Private REDD+ projects in Brazil.

[7] The discussion of Article 6 for the fulfillment of countries' NDCs includes three cooperation mechanisms: 1) Article 6.2. ITMO (Transferred Mitigation Outcomes); 2) Article 6.4 SDM (Development Mechanism); 3) Nonmarket approaches. The ITMO is intended to be the compliance mechanism through the corresponding adjustments to countries' NDCs, which still faces a number of technical and political bottlenecks.

[8] See ATMADJA, Stibniati S. et al. How do REDD+ projects contribute to the goals of the Paris Agreement? Environmental Research Letters , v. 17, n. 4, p. 044038, 2022.

3. UNDERSTANDING REDD+ IN BRAZIL

More recently, at the end of 2024, the enactment of Ordinary Law No. 15,042 of December 11, 2024 finally established the Brazilian Greenhouse GasEmissions Trading System (SBCE), regulating the carbon credit market in the country and significantly changing the institutional environment for REDD+. Under this law, the Brazilian Regulated Carbon Market will operate on the basis of an emissions trading system that organizes transactions between creditors and debtors of permitted emissions, the so-called Cap-and-Trade, which sets a clear limit on the amount of GHG emissions that companies can emit depending on the nature of their activity (Figure 4). This limit seeks to create incentives for emitting companies to adapt their production processes and economic activities with a view to meeting their respective emissions target, which is now accounted for in Brazil's NDCs as a whole. If they fail to meet their targets, companies can offset excess emissions by buying carbon credits from companies with a balance of credits available for sale on the market.

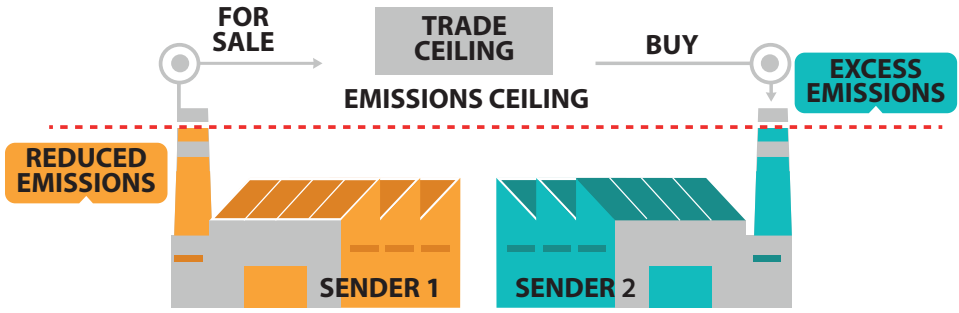


Figure 4: Cap-and-trade mechanisms in the regulated carbon market.

The new law also creates important institutes for the functioning of the regulated market, in particular:

• Brazilian Emissions Quota (CBE): establishes a system of GHG emissions ceilings for sectors of the economy that are now obliged to comply with their emissions targets. If sectors are unable to comply with the emissions ceiling by adapting their activities, they are obliged to offset their excess emissions by buying carbon credits available on the market;

• Certificate of Verified Reduction or Removal of Emissions (CRVE): Title that represents a quantity of emissions reduced or removed from the atmosphere that corresponds to one tonne of carbon dioxide equivalent of carbon credit (¹ tCO^2e) certified according to the corresponding methodology.

The new law also establishes a new nomenclature for carbon credit generation projects or programs already operating in the country, based on the ownership of the rights to these credits and the legal nature of these initiatives. Figure 5 provides a schematic presentation of the variations in this nomenclature of REDD+ projects or programs based on these criteria, differentiating these initiatives between jurisdictional and voluntary/private between state and non-state; between market and non-market approaches; and between those backed by jurisdictional and non-jurisdictional territories generation of carbon credits and the rights to their commercialization.[9]

[9] We have adopted this nomenclature based on Law 15.042/2024, considering it to be more precise than the terminology often used in the literature, which can lead to conceptual confusion. The term "jurisdictional projects"é

4. REDD+ INSTITUTIONAL ARRANGEMENTS IN BRAZIL

Each type of REDD+ project is subject to its own regulatory regime and a corresponding institutional arrangement. The set of these different arrangements forms what we call here the "REDD+ Architecture" (see fig. 5), which organizes the typology within which each of these project types is linked. Each type of project with its respective institutional arrangement is linked to some methodology for measuring, reporting and validating (MRV) the carbon credits generated. This arrangement also includes a governance system, a common reference level for forest emissions (FREL) and a strategy to guarantee the permanence of carbon stocks in the project areas.

The generation carbon credits is often linked to a company that certifies these credits, the main ones being VERRA and ART. So, for example, a voluntary REDD+ project being developed in a private area could have its carbon credits certified according to the parameters of the VERRA Verifible Carbon Standard (VCS) institutional arrangement, while another stateinitiated jurisdictional project being developed in the state of Acre could have its carbon credits certified according to the parameters of the ART REDD+ TREES Environmental Excellence Standard institutional arrangement. Variations in these arrangements can also involve the financial model adopted in the project, which may involve the purchase and sale of carbon credits or a donation made on the basis of emissions avoided or reduced.

is commonly associated with initiatives run by state entities, when in reality there are also methodologies linked to non-state jurisdictions, such as VERRA's jurisdictional methodology. , the term "voluntary projects" is often misinterpreted as synonymous with projects developed in private areas and certified by certifying bodies such as VERRA or the Gold Standard. However, this conception is inaccurate, as certification can cover collective areas, not just private ones, and the resulting carbon credits can be traded on regulated markets, especially after the approval of Article 6 of the Paris Agreement.

In the case of a project that seeks to sell carbon credits, there will also be a difference in the arrangement if the market for these credits is voluntary or regulated. Another important source of variation in these arrangements will be the ownership of the right to the carbon credit and the way in which the respective benefits are shared, which may be state, private or collective; as well as linked to different levels of governance, i.e. linked to the federal government, state, collective governance within a protected area, private governance or even a nested governance system, in which multiple REDD+ initiatives at different levels are combined into a single system for the purposes of governance, measurement, safeguards and financing.

State REDD+ initiatives, i.e. those that consider state ownership of the rights to the carbon credits generated, are classified as "public carbon credit projects" (Art. 2, XXVIII/Law No. 15.042/2024)[10], those that remunerate the results obtained through a donation, referred to in Art. 2, XXV of Law No. 15.042/2024 as "state REDD+ programs with a non-market approach (PERNM)" and those that remunerate credits to be sold on the market (Art. 2, XXV of Law No. 15.042/2024). XXV of Law 15.042/2024 as "state REDD+ programs with a non-market approach (PERNM)" and those that pay credits to be sold on the market, called "jurisdictional REDD+ carbon credit programs with a market approach (PJRM)" in Art. 2, XXVI of Law 15.042/2024.

[10] Although provided for in Law 15.042/2024, this category is still in its infancy and there is little information about it, given the scarcity of concrete experiences in this area. Specific regulation of this type of project is expected in the future. According to this law, these projects must be "developed by public entities in areas in which they have cumulative ownership and usufruct, as long as there is no overlap with areas legitimately owned or usufructed by third parties". See more in BRASIL. Law no. 15.042, of December 11, 2024. Available at: https://www2.camara.leg.br/legin/fed/lei/2024/lei-15042-11- -december-2024-796690-publicaçãooriginal-173745-pl.html . Accessed on: 13 feb. 2025.

Still based on the same classification of the Carbon Market Law, the categories of non-state REDD+ projects include "private REDD+ market approach carbon credit projects" (PPRM) and "collective REDD+ market approach carbon credit projects" (Art. 2)[11] . It is also important to note that the evolution of these arrangements constantly incorporates new learning as new approaches to improving the intended results are tested and validated, as recently happened with the changes to the existing methodologies for benefit sharing, consultation and safeguards that were incorporated into the Climate, Community and Biodiversity Standard (CCB) arrangement by the VERRA certifier, seeking to improve results beyond those directly linkedtothe carbon credit itself.[12]

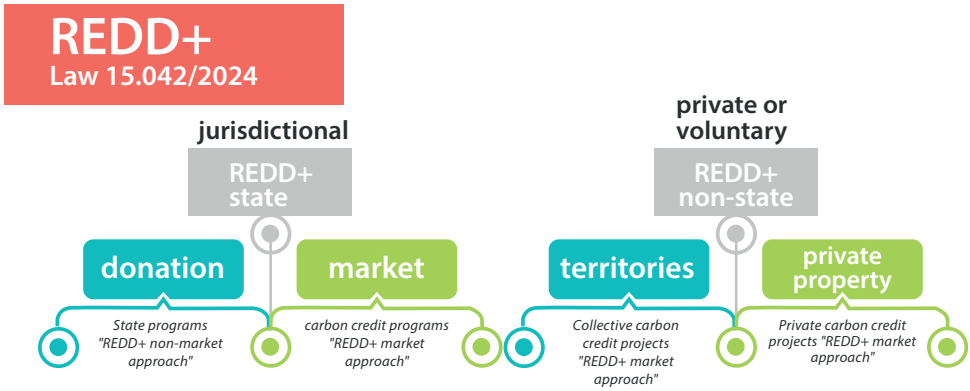


Figure 5: REDD+ architecture in Brazil.
Source: Prepared by Instituto Fronteiras.

[11] Although this nomenclature is not adopted by law or in the literature, we have taken the liberty of identifying it considering the inclusion of REDD+ projects in collective territories (e.g. Surui Forest Carbon Project) See ALLIANCE, Rainforest. Evaluation report for the validation of the Surui Forest Carbon Project-Brazil. Richmond: Rainforest Alliance, 2012.

[12] See SESSIN-DILASCIO, Karla; ROSSI, Charles Borges; SINISGALLI, Paulo Antônio de Almeida. The Institutionality of Environmental Justice in a REDD+ Compensation Project. Ambiente & Sociedade, v. e00188, 2024.

4.1 Carbon credit

As is already clear from the above, every REDD+ project needs to measure the amount of GHG emissions avoided or reduced in efforts to maintain the standing forest. Carbon credits are the unit of measurement used to measure this effort. But what are carbon credits anyway? To answer this question, we first need to understand what the "Greenhouse Effect" is and how it contributes to climate change.

In a nutshell, the greenhouse effect is the impact that the excess of carbon dioxide and other gases emitted by human activity into the atmosphere has on the increase in the Earth's temperature. It is therefore a negative effect that makes it difficult to maintain the planet's ecological balance, with consequences for all the cycles on which life on the planet depends. This balance, which is fundamental for life, depends on the limits that the Earth has to process the gases that cause the greenhouse effect (GHG) and which are maintained through its so-called biogeochemical cycles. The loss of the planet's ability to guarantee this balance generates the Climate Change that we talk about so much. The carbon cycle is one of these biogeochemical cycles which are fundamental to life on Earth (figure 6).

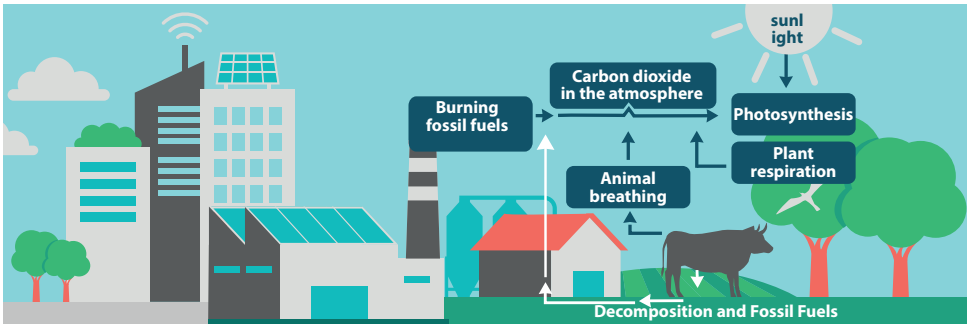


Figure 6. Carbon biogeochemical cycle.
Source: Copyright (c) 2022 Bakhtiar Zein/Shutterstock13.

Within the carbon cycle, carbon dioxide (CO2) from the atmosphere is absorbed by plants through photosynthesis and incorporated into plant cells and structures. Carbon is transferred between species through food and released back into the atmosphere either through the human-caused processes of deforestation and burning, or through the burning of fossil fuels, as well as through the natural processes of animal and plant respiration and decomposition.

Carbon dioxide in the atmosphere acts as a blanket and is responsible for retaining solar radiation on Earth (energy that reflects the sun's heat), increasing the Earth's temperature. Within the planet's natural limits, the Greenhouse Effect guarantees favorable temperature levels on Earth for the maintenance of life. However, the excessive emission of carbon into the atmosphere by human activity releases carbon dioxide and other gases that were previously stored in forests and underground, increasing the concentration of these gases in the atmosphere. This increase intensifies the Greenhouse Effect, threatening the planet's balance and causing the climate catastrophes we see every day on the news[14].

It is this mismatch in the increase in the availability of carbon dioxide beyond the limits of what can be recycled by the Earth through biogeochemical cycles that generates the climate imbalance known as Climate Change. In addition to carbon dioxide (CO2), other greenhouse gases (GHG) are responsible for contributing to the Greenhouse Effect, such as methane (CH4), nitrogen oxide (N2O), water vapor (H(2)O), among others.

[13] See ESCOLA KIDS. Carbon cycle. Available at: https://escolakids.uol.com.br/ciencias/ciclo-do-carbo- no.htm .Accessed on: 13 Feb. 2025.

[14] For more details on climate change, see COLLECTIVE PROTECT. Climate. Available at: https://coletivoproteja.org/clima/ . Accessed on: 24 Feb. 2025.

To facilitate efforts to organize the activities needed to maintain a balance in GHG emissions, it has been agreed to use carbon as the standard unit of measurement for the gases that contribute to the intensification of the Greenhouse Effect and climate change. Among the existing GHGs, each gas has its own Global Warming Power, which indicates how much it retains heat in the atmosphere compared to CO_2. Methane gas (CH4), for example, retains 28 to 36 times more radiation than carbon dioxide (CO_2). Thus, one ton of avoided methane emissions is equivalent to reducing emissions by 28-36 tons of carbon equivalent, i.e. 28-36 carbon credits.

Figure 7 shows the upward trend in global average temperature between 1880 and 2020, a period in which temperatures have been rising in relation to the average for the century, reaching a peak in recent years. Researchers point out that this increase causes the intensification of extreme events caused by climate change as we move away from the average. An increase of just 1.5°C in the planet's average temperature, for example, a level that has already been reached by 2024, is already generating quite significant effects in terms of disasters caused by climate change, as we have witnessed in various parts of the world over the past year. Controlling this trend requires various measures to reduce global GHG emissions so that the effects of global warming and climate change can be mitigated. REDD+ is precisely one strategy for this, creating incentives so that countries, states, companies and organizations can be remunerated for their actions that seek to maintain or increase carbon stocks in the forest, reducing their concentration in the atmosphere.

Carbon credit, measured in tons of carbon equivalent, is the unit of measurement used to quantify GHG emissions avoided or reduced in the process of generating them.

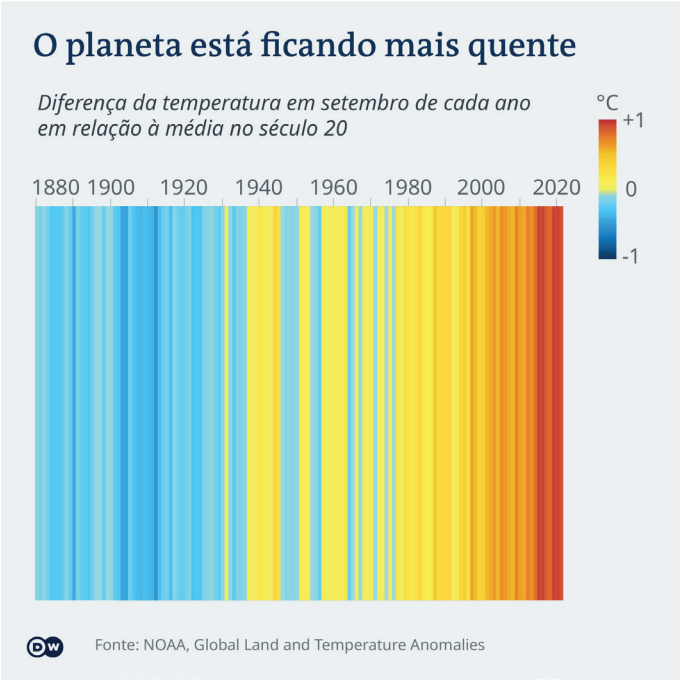


Figure 7. Bar graph the intensification global warming (1880-2020).

In other words, how much the efforts aimed at preserving forests, reducing deforestation and fires, reforestation and other efforts to reduce GHG emissions have been converted into tons of carbon equivalent that are no longer emitted into the atmosphere.

Carbon stocks are NOT carbon credits! Carbon stock is the total amount of carbon stored in soils, forests or ecosystems and is an environmental asset, but not tradable as a credit. Carbon credit refers to the reduction or removal of GHG emissions, proven by methodologies, resulting from additional actions that avoid emissions or capture carbon. Conserving existing stocks is vital, but only generates credits with measurable changes.

A very important point in this regard is that simply keeping the forest standing does not automatically generate carbon credits. On the contrary, credits need to be generated, which can only be done through the measurement and technical certification of these credits. This process is necessary to prove the effect of the activities carried out in order to reduce or avoid unwanted emissions.

This certification process requires first of all that the activities must generate additionality of reduced or avoided emissions compared to what is expected to occur in the absence of these activities. This additionality is measured by the change in carbon stocks in a given area considering a baseline projected into the future without considering the project, what we call businessas- usual (BAU)[15], with the scenario expected from the implementation of the project. In private projects on the voluntary market, this baseline is based on identifying the dynamics of stocks in a reference area[16].

In state projects in the jurisdictional market, the baseline is taken as the average deforestation within the respective jurisdiction over the years.

[15] The concept of "business-as-usual" (BAU) refers to a reference scenario in which economic, environmental or social activities continue without any significant change, following historical trends and existing practices. This term is widely used in areas such as sustainability, climate change, economics and strategic planning.

[16] The reference area baseline in REDD+ projects represents the reference scenario that estimates the rates of deforestation and carbon emissions that would occur in the absence of project implementation. This concept is essential for quantifying the climate benefits of REDD+, as it allows us to compare what actually happened in the protected area with what would have happened without the intervention.

Box 1. REDD+ and reforestation

Some certifiers only consider REDD+ projects to be those strictly dedicated to REDUCING deforestation and forest degradation, by conserving existing forest areas and developing activities for this purpose. On the other hand, the recent Law 15.042/2024 also considers reforestation projects (restoring forests that have been degraded or cleared planting native species or encouraging natural regeneration in areas that were previously forested), afforestation (planting forests in areas where there were previously no forests, creating new vegetation cover) and revegetation (recovering any type of vegetation in degraded areas, not necessarily forests) to be part of REDD+, even if they are dedicated to REMOVING carbon and other gases from the atmosphere.

In addition to proving additionality, certification also requires that REDD+ projects avoid double counting carbon credits. In other words, it is necessary to properly account for and offset carbon credits generated at different scales, ensuring that there is no overlap between the various initiatives, whether private, collective or jurisdictional, guaranteeing that the credits previously accounted for are subtracted from the tally. Efforts towards this goal require the creation of transparent platforms for accounting for the credits generated by governments, taking into account all existing projects regardless of their type.

Finally, certification also requires a guarantee of the permanence of the results obtained by the REDD+ project or program. This means that REDD+ projects must focus on activities that guarantee the permanenc reduction results by avoiding deforestation/degradation leakage to other regions.

Projects whose activities generate, for example, the migration of people to other areas, generating new deforestation, should not be considered effective in terms of additionality efforts for reduction[17] and could result in the suspension or annulment of the respective credits generated.

Table 2. REDD+ indicators

Additionality

REDD+ projects must guarantee the additionality of efforts to reduce GHG emissions from deforestation and forest degradation.

Double counting

REDD+ projects must avoid double-counting, and it is necessary to consolidate transparency platforms for the carbon credits issued in each REDD+ project at different scales. The carbon of the same region cannot be added up twice because of overlapping projects.

Leakage

REDD+ projects must define strategies that reduce possible impacts in terms of leakage, avoiding the migration of deforestation/forest degradation to other regions, which would have negative effects on the project's additionality. In other words, preservation on one side, but deforestation on the other (elsewhere).

Permanence

REDD+ projects must create strategies that guarantee the permanence of reduction efforts in the long term. The project must have a long implementation period to guarantee the reduction of emissions.

[17]See ANGELSEN, Arild (Ed.). Moving forward with REDD: issues, options and implications . Cifor, 2008.

COP19 in 2013 contributed significantly to the creation of reliable mechanisms for verifying the additionality, permanence and leakage of REDD+ projects, through the creation of the Warsaw Framework for REDD+ (Figure 2), establishing formal guidelines for countries and entities to receive funding based on verified reductions in deforestation and forest degradation, through payment by results. This framework linked REDD+ to monitoring, reporting and verification mechanisms. - MRV).

The carbon credit certification process has also increasingly taken into account the relevance of issues related to the socio-environmental justice of initiatives. In this regard, REDD+ projects and programs must establish initiatives to comply with the Cancun safeguards (Figure 12), and commit to Free, Prior and Informed Consultation (FPIC) processes (Figure 13). Inaddition, it is essential to establish mechanisms for distributive justice, throughlegitimate benefit-sharing processes (see Box 3).

CPLI	Safeguards
Process that ensures communities are consulted before implementation, in a transparent, respectful way and without coercion. Ensuring that traditional populations, indigenous peoples and local communities have an activevoice in decision-making on projects that impact their territories and ways of life.	Guidelines that minimize negative impacts and enhance social and environmental benefits. Guarantees the protection of human, environmental and cultural rights and respect communities and ecosystems.

Box 3. Definition and purpose of Free, Prior and Informed Consultation and safeguards.

5. REDD+ ARCHITECTURES

We call REDD+ project architecture (Figure 7), the institutional arrangements that each project refers to the methodology for measuring carbon credits (payment by results or Verifiable Carbon Standard). But also the financial model adopted for trading carbon credits (voluntary market, regulated market, sale or donation), the ownership of carbon rights (public, private, collective). In addition, the benefit sharing methodology, and the level of governance to which the project or program is subject (national government, sub-national government, collective property within a protected area, private property)[18]. In this session we will go into more detail about each REDD+ architecture presented in Figure 5:

State REDD+		Non-state REDD+
State REDD+ programs non-market approach (PERNM)	Jurisdictional carbon credit projects / programs "REDD+ market approach" (PJRM)	Private REDD+ market approach carbon credit projects (PPRM)

5.1 Non-state REDD+

[18] See SESSIN-DILASCIO, Karla; BORGES-ROSSI, Charles; SINISGALLI, Paulo. Discovering REDD Plus in Brazil. Sustainability, v. 16, n. 13, p. 5409, 2024.

The first step in the process required to certify carbon stocks in non-state REDD+ projects is to identify the forest area in which the project will be developed and clearly establish the right holders of the carbon credits. This area can be a private property or a collective territory (Box 4).

Table 4. Ownership of carbon rights according to Law 15.042/2024

Law 15.042/2024 distinguishes between jurisdictional programs and jurisdictional REDD+ projects. According to art. 43, REDD+ projects are those developed in areas owned by the national government (vacant lands and federal conservation units), the state or federal district (district or state conservation units) or the municipality (conservation units).

The article emphasizes that indigenous peoples have ownership of the carbon on their lands ("V - "original ownership of indigenous communities over carbon credits generated on their respective indigenous lands described in art. 231 of the Federal Constitution"), as do extractive communities ("VI - the original ownership of extractivist and traditional communities over the carbon credits generated in the respective sustainable use conservation units that admit their presence, provided for in items III, IV and VI of the caput of art. 14 of Law no. 9.985, of July 18, 2000"), quilombola communities ("VII -the original ownership of quilombola communities over the carbon credits generated in the respective remaining lands of quilombola communities, provided for in art. 68 of the Transitional Constitutional Provisions Act") and settlers benefiting from agrarian reform ("VIII - the original ownership of settlers benefiting from agrarian reform programs residing in settlement projects"). 68 of the Transitional Constitutional Provisions Act") and settlers benefiting from agrarian reform ("VIII - the original ownership of settlers benefiting from agrarian reform programs residing in settlement projects over carbon credits generated on plots in settlement projects of which they have usufruct, regardless of whether or not they already have title to the land").

Figure 8 illustrates the main steps for certifying non-state REDD+ projects. The path begins with identifying the property or communities responsible for managing the land. The property owner can contract or make an agreement with the organization, whether it be a company or NGO, responsible for developing the project. These projects go through a lengthy certification process, which begins with the contracting or agreement with a company that will develop the project, called the "Project Developer". This organization must help the carbon credit right holder go through the certification process by producing the necessary documents to comply with the chosen certification methodology (Figure 8). The project developer defines, together with the carbon right holder, the activities that must be carried out by the project proponent to guarantee additionality, permanence and prevention of leakage of deforestation and forest degradation to other regions, in order to meet the requirements of the chosen standard.projeto para garantir a adicionalidade, permanência e prevenção de vazamento do desmatamento e degradação

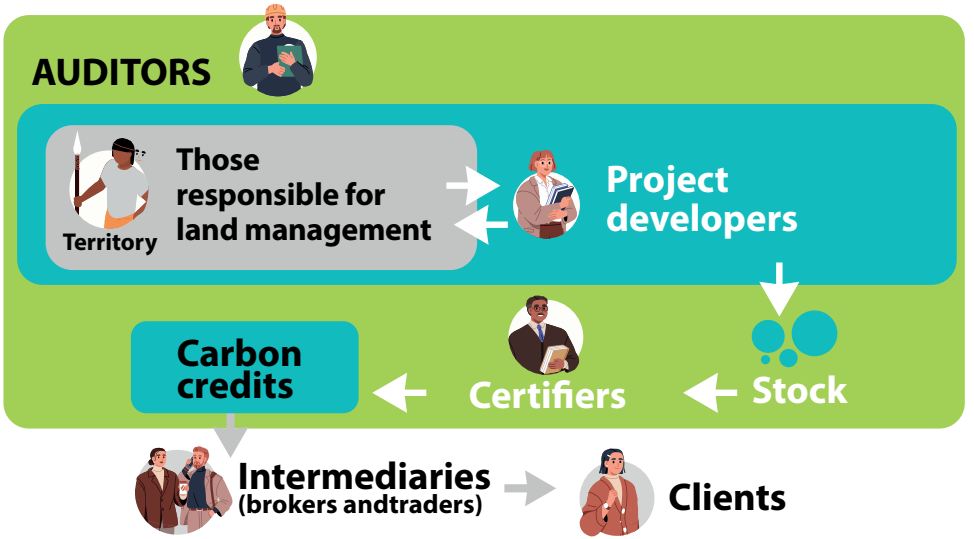


Figure 8. Steps for certifying non-state REDD+ projects. Source: Prepared by Instituto Fronteiras.

Non-state REDD+ projects can have as their territory areas of private or collective property whose carbon ownership is in the hands of the private owner of the land, land reform settlements or collective areas such as indigenous lands, extractive reserves, quilombola territories.

The standard is the technical name given to the chosen certification methodology. The standard establishes the methodological parameters that define how much of the project area's carbon stock can actually be converted into carbon credits.

Accounting for the carbon equivalent avoided is defined through an extensive process of biomass assessment of forest carbon stocks, compared to the baseline of the reference area, defined by the chosen certification methodology.

In general terms, the certifier measures the amount of carbon emissions avoided by reducing deforestation and forest degradation and issues a certificate proving that these emissions have been avoided. It is this certificate that can be sold as a carbon credit. The certificate is called a Verified Carbon Unit (VCU). These are the certificates issued by organizations that develop certification methodologies after the project has passed the certifier's analysis for non-state projects, Box 5.project to guarantee additionality, permanence and prevention of leakage from deforestation and degradation.

Box 5. What is a standard?

"Standard" is a very important element for the carbon market in general and not just for REDD+ projects. A well-known example of a standard are the ISO (International Organization for Standardization) norms.

The "standards" define the methodologies and processes needed to transform the carbon stock, in the case of REDD+, into carbon credits that can be sold on the regulated or voluntary market.

Organizations that develop methodologies, such as Verra, GoldStan- dard or ART - Architecture for REDD+ Transactions, have developed various standards for certifying REDD+ projects and other types of projects. Here are some existing REDD+ standards by methodology developer:

Verra: VCS (Verified Carbon Stan- dard) standard, CCB (Climate, Community and Biodiversity) quality standard.

https://verra.org/

ART - Architecture for REDD+ Transac- tions: TREES standard (REDD+ Environ- mental Exception Standard)

https://www.artredd.org/trees/

Gold Standard: Land use and forestry requirements

https://globalgoals.goldstandard.org/

The carbon credit certificate will only be issued once all the documents produced by the project developer have been assessed and approved? by the certifier. The certifier is an independent entity, accredited by Verra, responsible for assessing and certifying that a project meets the requirements of the standard chosen by the project. Assessment by the certifier follows three stages:

- Validation: certifies that the project design complies with the methodological and regulatory requirements of the standard prior to its implementation.
- Verification: confirms that the results reported by the project (such as reductions in carbon emissions) are real, measurable and permanent, allowing the issuance of carbon credits (VCU).
- Registered: after verification, the project is registered with Verra, which allows the generation of carbon credits that can be traded.

Once the VCU has been issued, the project proponent can contact a carbon sales company or platform, or sell the credit directly to interested companies and governments.

The PPRM architecture differs from those of the PERNM and PJRM in that it defines an integral preservation area that must be kept intact throughout the years of the project. Unlike jurisdictional models (PJRM), whose method is based on payment for deforestation results from a historical baseline, the PPRM must define a preservation area and guarantee the reduction of deforestation and future forest degradation, in contrast to the historical baseline of deforestation in the reference area19 .

The permanence of the project's results over the years is an essential indicator. The project must show that its efforts will be permanent

This means that it is not enough for project to prevent deforestation and forest degradation in its area. The project needs to demonstrate preventive actions so that there is no leakage of deforestation and forest degradation, which means that it is not enough for the project to prevent deforestation in its area, it must prevent the agents (drivers) of deforestation from migrating to other areas, containing the risks of reversal of deforestation and ensuring the permanence of the reduction results.

Perverse mechanism of REDD+ project certification methodologies: They value REDD+ projects whose forests are in reference areas with high deforestation rates.

5.1.1 Who is VERRA?

In Brazil, Verra is the leading certifier of PPRM projects. Founded in 2007 in California, Verra is a private non-profit association. It manages the world's leading voluntary carbon market program, the Verified Carbon Standard (VCS)[19], with 1,775 certified projects and 944 million verified carbon units, spread across all continents of the globe[19] .

[19] The methodologies created and updated by Verra undergo evaluation by the Integrity Council for the Carbon Market, an independent, non-profit governance body that aims to establish and maintain a global standard of high integrity in the voluntary carbon market. It was created in 2021 with the aim of increasing trust and transparency in the market, and works to set clear standards and guidelines to ensure that carbon credits represent real and additional reductions in GHG emissions.

For PPRM projects to be economically viable, a large number of hectares need to be preserved and projects need to last 30 to 40 years. Researchers point to areas larger than 10,000 ha.

Verra certifies various land use change projects, organized under the AFOLU umbrella (Agriculture, Forestry and Other Land Uses), using different methodologies of the VCS standard, for the measurement and certification of tons of carbon equivalent (ton eCO2) translated into tradable Verified Carbon Units (VCUs). We won't go into detail about the AFLOU methodologies[21]. What is important to understand is that there are two main types of REDD+ projects recognized by Verra: 1) Avoiding Planned Deforestation (APD) and 2) Avoiding Unplanned Deforestation AUD)[22].

The REDD+ methodology for unplanned deforestation (AFLOU/AUD) is applied to projects in which avoided deforestation is generated by unplanned sources. In other words, from sources considered illegal such as land grabbing, deforestation by invasion, among others. In the case of the Amazon, AUD projects can only account for avoided carbon in the 20% of

[20] See VERRA. Certified projects and verified carbon units. 2022. Available at: https://registry.ver- ra.org/app/projectDetail/VCS/1113 . Accessed on: 07 Mar. 2025.

[21] or more details read WEST, Thales AP; BOMFIM, Barbara; HAYA, Barbara K. Methodological problems with deforestation baselines compromise the integrity of REDD+ carbon offsets. Global Environmental Change , v. 87, p. 102863, 2024.

[22] See WEST, Thales AP; BOMFIM, Barbara; HAYA, Barbara K. Methodological problems with deforestation baselines compromise the integrity of REDD+ carbon offsets. Global Environmental Change , v. 87, p. 102863, 2024.

the area allowed by the Forest Code (Law No. 12.651/2012) for vegetation suppression; the remaining 80% is not taken into account in the project's calculation. This is because the project has to prove additionality in reducing deforestation, taking into account national legislation.

The REDD+ methodology for planned deforestation (AFLOU-

/APD) is applied to planned avoided deforestation and forest degradation projects. In this case, the project developer needs to present documentation proving that the area will be used for logging activities, agricultural expansion or the development of infrastructure projects approved by the state or federal licensing body. Normally, the developer must submit a vegetation suppression permit, management permit or other document proving that the approval of the logging activity took place before the carbon project was drawn up[23].

AFLOU/APD projects must comply with national legislation, but the amount of carbon eligible for certification may be greater than AFLOU-/AUD depending on the deforestation and/or forest degradation activity that has been avoided by REDD+. Verra-certified projects go through different phases up to certification, including development, validation, verification and the issuing of carbon credits (Box 6).

During the development phase, the proponents draw up the methodology and submit the project for validation by an independent third party. Once approved, the project enters the monitoring and verification stage, where its emission reductions are quantified and audited periodically. Only after this verification the carbon credits issued and made available on Verra's register for trading.

[23] See VERRA. REDD Methodology Framework (REDD-MF) v1.6. 2024 Available at: https://verra.org/methodologies/redd-methodology-framework-reddmf-v1-6/ . Accessed on: 07 Mar. 2025.

Status of the project	Description
In development	Project developers can register their projects with Verra before they are fully implemented. This allows project developers to get feedback from Verra on the design and methodology of their projects and to start the process of certifying their projects. They are not yet eligible to generate carbon credits.
In validation	These are projects registered with Verra and in the process of being validated. They are not yet eligible to generate carbon credits.
Registered	These are projects that have been registered with Verra and have met the requirements of Verra's methodology. This means that the project has undergone a rigorous review and assessment process and is considered credible and additional. These are projects registered with Verra that are eligible to generate carbon credits, but are not yet able to generate carbon. Certification is the process by which an independent auditor verifies that the project meets the requirements of the Verra methodology
Approval of requested verification	Projects that have been registered with Verra and verified by an independent auditor. This means that the project has met the requirements of the Verra methodology and is able to generate carbon credits. These projects can start generating carbon credits from the date they were registered with Verra.
Withdrawn	This indicates that a project has been voluntarily withdrawn from certification program or process. This can happen for various reasons, such as • Decision by the project developer not to continue with the certification process; • Problems related to the viability of the project; • Changes in the objectives of the project or its backers. When a project is marked as "Withdrawn", it ceases to be active in the Verra system and can no longer generate certified carbon credits, although it may still be listed for historical and transparency purposes.

5.2 State REDD+

Jurisdictional REDD+ programs or projects can be operated through funding by donations or by selling certified carbon credits. In Brazil, jurisdictional programs are homonymous with state REDD+ programs, but cover an area larger than a private property and have national or sub-national government entities involved. Examples of state "REDD+ non-market approach" (PERNM) programs are REM/AC and Fundo Amazônia. Examples of jurisdictional "REDD+ market approach" (PJRM) carbon credit programs or projects are those certified by Verra or ART TREES. All of them will be detailed below.

What is common to both is that they cover a large area, larger than a private property, and are run by the state, either the federal government or the sub-national government, with or without the participation of other social actors. Both differ in the methodology used to measure carbon and in the agreements for the use of these credits.

Generally speaking, PRNMs are state REDD+ programs that use the payment-by-results methodology as the main method of measuring the amount of carbon avoided. These programs reward countries or sub-national jurisdictions that have demonstrated verifiable results in reducing greenhouse gas emissions from the deforestation of tropical forests 24.

In the payment-by-results methodology, the states or the federal government demonstrate that they have a reliable mechanism for verifying the avoided GHG emissions via remote sensing (e.g. PRODES), the country chooses a relevant historical period to calculate the average emissions.

[24] See GIZ. 2022. 10 Years of Experience of the REM Program - REDD Early Movers: Lessons from Acre, Mato Grosso (Brazil), Colombia and Ecuador. Brasília: GIZ & KFW.

Based on the historical data, what would be emitted in the future if there were no intervention is estimated, the FREL (Table 7). Current emissions are compared with the FREL to determine the reductions achieved, the results are verified by independent entities and the surplus between the FREL and actual emissions corresponds to the amount of carbon avoided and eligible for payment.

Table 7. Reference area and FREL

The historical average of deforestation is called the "Forest Emissions Reference Level" or FREL. The FREL is used as a "baseline" that establishes a comparison parameter between two REDD+ project scenarios:

Scenario 1: deforestation rate in the jurisdiction where there is no REDD+ project, called business-as-usual (BAU);

Scenario 2: deforestation rate in the region in a scenario with the REDD+ project.

The equation between the reduction in deforestation and forest degradation in scenario 1 compared to scenario 2 is one of the elements needed to define the amount of carbon credits from the project.

The need for additionality in efforts to combat deforestation and forest degradation creates an environment in which projects located close to reference areas with high rates of deforestation end up being valued, since these projects produce more carbon credits compared to forest areas less threatened by deforestation.

The Forest Reference Emission Level (FREL) as a baseline is used to quantify emissions deforestation and thus assess the country's performance in mitigating climate change.

5.2.1 National REDD+ Strategy

The implementation of the National REDD+ Strategy (ENREDD+) and the National REDD+ Council (CONARED+) in 2015 consolidated the decentralization of REDD+ payments through the creation of CONARED-D+ resolutions that regulated the actions of the federal and state governments in relation to carbon, as shown in Figure 9.

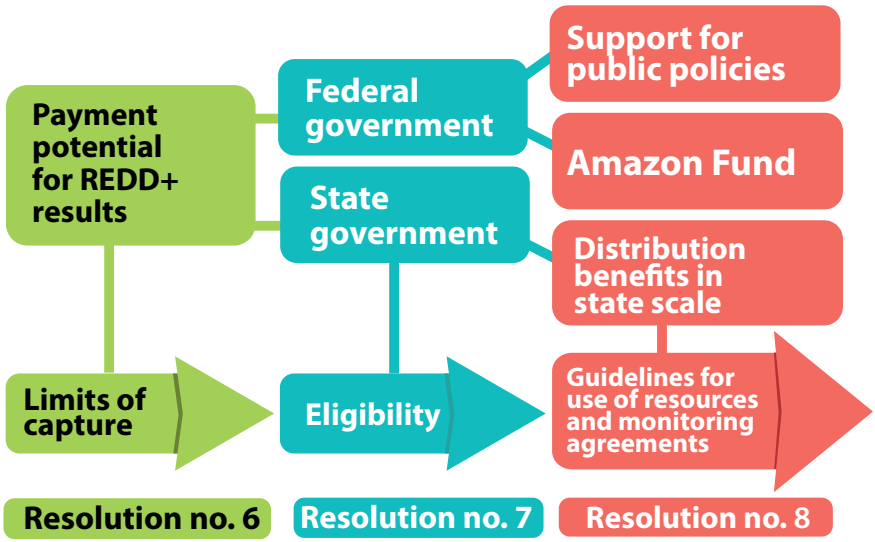


Figure 9. Process of decentralizing the collection of payments for REDD+ results. Source: (MMA, 2018)

The potential funding for REDD+ "payment by results" is distributed between the federal government and the states of the Legal Amazon, following CONARED+ Resolution No. 06, which defines the "distribution of REDD+ funds". *limits for collecting payments for results in reducing emissions from deforestation in the Amazon biome".*

*T*he resolution describes the states of the Legal Amazon that can receive the benefit (i.e. AC, AP, AM, MA, MT, PA, RO, RR, TO), and defines the division of the allocation of carbon credits from payments by result for the Union (40%) and for the states (60%), considering that each state can transact "a minimum of 2% of the total results of reducing emissions from deforestation in the Amazon biome" (art. 8).

The resolution points out that it is not possible to "make an inter-national transfer for the purposes of fulfilling international mitigation commitments and will not affect national accounting" for Brazil's NDCs in the Paris Agreement (art. 5, paragraph 3)[25] (Figure 10).

Figure 10. Graph on the distribution of carbon benefits between states and the Union. Source: Modified from MMA, 2017.

[25] See CONAREDD+. CONAREDD Resolutions. Available at: http://redd.mma.gov.br/pt/resolucoes-da-conaredd . Accessed on: 07 Mar. 2025.

Resolution 7 points to the institutional structure needed for states to be able to access payments for REDD+ results, in terms of structuring participatory, operational and transparent governance over these projects. The need to appoint a body responsible for funding (for states) or a manager (for federal entities), a participatory, operational and transparent governance structure and transparency mechanisms on the use of resources, respect for REDD+ safeguards and the performance of initiatives.

Resolution No. 8 indicates the guidelines that entities must follow when signing payment-by-results agreements in terms of the use of resources and the monitoring of payments in terms of sending annual reports (physical--financial, accounting audit, compliance with safeguards and final impact) and making information about the project available on the Info Hub Brazil platform[26] presented annually to CONAREDD+.

Examples of PERNM projects include the REDD+ for Early Movers (REM) program, created in 2011 by the German Federal Ministry for Economic Cooperation and Development (BMZ) and officially launched in 2012 at Rio+20[27].

The Amazon Fund is another example of a PERNM program. Created in 2008, the Fund received its first contribution of funds from Norway in 2009, in the amount of approximately US$ 110 million. This payment was based on the reduction in emissions from deforestation between 2006 and 2008 (Figure 11), a period in which Brazil showed significant drops in deforestation in the Amazon[28] .

[26] See MINISTRY OF THE ENVIRONMENT (MMA). Infohub Brazil. Available at: https://infohubbrasil.mma.--gov.br/en/ . Accessed on: 07 Mar. 2025.

[27] See GIZ. 2022. 10 Years of Experience of the REM Program - REDD Early Movers: Lessons from Acre, Mato Grosso (Brazil), Colombia and Ecuador. Brasília: GIZ & KFW.

[28] See CORREA, Juliano; VAN DER HOFF, Richard; RAJÃO, Raoni. Amazon Fund 10 years later: lessons from the world's largest REDD+ program. Forests, v. 10, n. 3, p. 272, 2019.

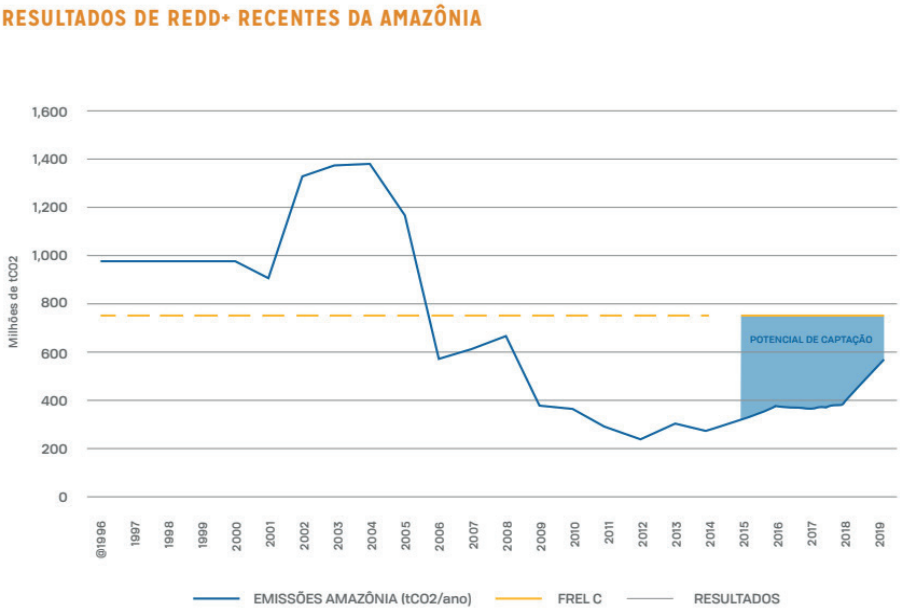


Figure 11. Historical emissions from deforestation in the Amazon and range of REDD+ results, considering Reference Level C (FREL C).
Source: (MMA; GIZ, 2021).

In 2012, the German Federal Ministry for Economic Cooperation and Development (BMZ) signed an agreement with the state of Acre to "pay for results" of deforestation avoided between 2011 and 2015 for Phase I (2012-2018) of the REM/AC program, receiving 25 million euros, and from 2017 to 2019, for Phase II (2017-2023) with an expected value of 30 million euros. Acre uses the measure of deforestation from 2001 and 2010 as the FREL for the reference metrics for reducing emissions. At the end of 2017, the REM signed an agreement with the state of Mato Grosso for payment as a result of a 90% reduction in deforestation between 2004 and 2014[29].

[29] See GIZ. 2022. 10 Years of Experience of the REM Program - REDD Early Movers: Lessons from Acre, Mato Grosso (Brazil), Colombia and Ecuador. Brasília: GIZ & KFW.

5.2.2 Architecture for REDD+ transactions

Methodologies for PJRM have not yet been applied in the states of the Brazilian Amazon, but the "Architecture for REDD+ Transactions" (ART)[31] of the REDD+ Environmental Excellence Standard (TREES[30]) is beginning to boost this category of REDD+.

TREES focuses on large-scale projects, at a jurisdictional or national level, and establishes 2.5 million hectares of forest as the minimum area for submitting projects. For this reason, the certification prioritizes agreements involving state governments or federal agencies and payments for results of REDD+ projects and triggers for reducing future emissions. In addition to payment by results, TREES has created its own methodology for certifying areas with high forest cover but low deforestation, called HFLD (High Forest Low Deforestation). Normally, REDD+ projects that follow Verra's methodology tend to prioritize regions with high forest cover but high deforestation, i.e. regions on the frontier of deforestation are under great pressure to convert land use.

[30] ART was established by Winrock International to create a robust, reliable and transparent standard for accounting for emission reductions from forest conservation activities, such as REDD+. Winrock International is a non-profit organization founded by Winthrop Rockefeller. The Rockefeller Family is one of the most influential dynasties in the United States, notable for its impact on the economic, philanthropic and political sectors. The family fortune was built up at the end of the 19th century, mainly by John D. Rockefeller, founder of the Standard Oil Company, which became one of the largest and most powerful oil companies in history.

[31] See ARTREDD. Trees. Available at: https://www.artredd.org/trees/ . Accessed on: 03 Dec. 2024.

The High Forest Low Deforestation (HFLD) methodology for REDD+ projects values REDD+ projects whose forests are in reference areas with low deforestation rates.

ART-TREES is currently the certification chosen by the Leaf Coalition (Lowering Emissions by Accelerating Forest Finance) for the development of its REDD+ projects. The Coalition is a global public-private initiative launched on Earth Day 2021 by the governments of Norway, the United States, the United Kingdom and, recently, South Korea, with aim of halting tropical forest deforestation by 2030[32]. Formed by governments from the Global North and international companies interested in mitigating or offsetting their GHG emissions by buying carbon credits from countries and sub-national governments in the Global South. Leaf is committed to reducing the risk and transaction costs of companies purchasing carbon credits.

Managed by the NGO Emergent, the Coalition launches periodic calls for proposals for forest governments interested in participating in Leaf (Expression of Interest- EOI) to participate in the monopoly market defined by the Coalition. With EOI approved, the forestry government must submit a detailed proposalof its jurisdictional program that will be evaluated by the

[32] See LEAF COALITION. Home. Available at: https://www.leafcoalition.org/pt/home/ . Accessed on: 14 Feb. 2025.

ART TREES standard that defines the amount of emission reductions that can be negotiated (Emission Reductions Purchase Agreement - ERPA).

The programs that meet the technical requirements move on to the formal negotiation phase of the agreements. Unlike the PRMs, the payment--by-results methodology does not provide conceptual clarity as to the ownership of the carbon in the territories in which this deforestation was avoided, nor even about the ownership of state and federal areas, considering the entire area of the state as part of the GHG reduction calculation, even though it includes areas owned by the Union and private areas.

5.2.3 Good governance of REDD+

Good governance in public policy should guide state REDD+ programs, ensuring that their implementation is aligned with fundamental principles such as transparency, accountability[33] social participation.

Monitoring and accountability are essential for the legitimacy and effectiveness of these programs, ensuring that clear and accessible data is made available to society. In this context, transparency in the negotiation and management of carbon credits (VCUs) is crucial.

[33] Accountability is a fancy way of saying that someone must be accountable for what they do. In a government, this means that politicians, judges and civil servants need to be transparent and accountable for their decisions. If a ruler makes a wrong decision, he must explain why and can even be punished if he is irresponsible. Researcher James Mahoney explains that this control doesn't come out of nowhere: it depends on the history and rules of each country. If a country has strong institutions and a tradition of holding its leaders to account, accountability works well. If institutions are weak or leaders don't have to explain themselves, power can be misused without consequences. In everyday life, accountability also applies to companies, schools and any place where someone has responsibility for something important. Ultimately, it's about trust: when there is accountability, we know that the people making decisions can't act without thinking about the consequences See MAHONEY, James; THELEN, Kathleen (Ed.). Explaining institutional change: Ambiguity, agency and power . Cambridge University Press, 2009.

Accurate accounting of credits, both at government level and in their jurisdictions (including private or collective projects), is necessary to avoid double counting and ensure the additionality of emission mitigation efforts under REDD+.

To strengthen accountability, state programs must establish transparency platforms that provide detailed information about the program, including annual performance reports, audits and other technical documents. This commitment to publishing information complies with the right of access guaranteed by the Access to Information Law (Law No. 12.527/2011)[34] , promoting greater control and engagement by society.

In addition, it is essential to create robust governance mechanisms that ensure not only social participation in the decision-making process, but also social control over the financial resources and environmental impacts of the programs. The implementation of independent monitoring and inspection bodies, together with the active participation of civil society actors, strengthens the legitimacy, efficiency and equity of REDD+ programs, ensuring that they achieve their environmental and socio-economic objectives in an ethical and sustainable manner (Box 8).

[34] Although Brazil has not signed the Escazú Agreement, an international treaty signed 2018 with the aim of guaranteeing access to information, public participation, and access to justice in environmental matters in Latin America and the Caribbean, good practices of state REDD+ programs that thrive on high integrity should guarantee actions that improve public management in environmental matters.

Box 8. State REDD+ projects as public governance

State REDD+ programs must be guided by good practices in public management, guaranteeing transparency of results, earnings and spending of resources; accountability as responsibility, rendering of accounts and the obligation to answer for actions and decisions to society and control bodies on the results or otherwise of the program; and participation for the purposes of social control over the actions, results and spending of the program.

6. SOCIO-ENVIRONMENTAL JUSTICE IN REDD+

6.1 SAFEGUARDS

Safeguards are principles and guidelines that aim to enhance the positive socio-environmental impacts and reduce the negative impacts related to REDD+ activities. They are used as general guidelines for action by governments, companies and auxiliary communities when conducting REDD+ projects or programs.

The Cancun Safeguards, established by UNFCCC decision 1/CP.16 at COP 16/ 2010 in Cancun-Mexico, created the basic guidelines for the development of safeguards for countries, sub-national states and certifiers interested in guaranteeing the integrity of REDD+ projects. Figure 12 presents a summary of the Cancun Safeguards.

1	Actions complementary to or consistent with the objectives of national forestry programs and other relevant international conventions and agreements;
2	Transparent and effective national forest governance structures, taking into 2 account national sovereignty and national legislation;
3	Respect for the knowledge and rights of indigenous peoples and members of local communities, taking into account relevant inter-national obligations, national laws and the United Nations Declaration on the Rights of Indigenous Peoples;
4	Full and effective participation of stakeholders, in particular indigenous peoples and local communities;

5	Actions complementary to or consistent with the objectives of national forestry programs and other relevant international conventions and agreements;
6	Transparent and effective national forest governance structures, in view of national sovereignty and national legislation;
7	Respect for the knowledge and rights of indigenous peoples and members of local communities, taking into account relevant inter-national obligations, national laws and the United Nations Declaration on the Rights of Indigenous Peoples;

Figure 12. Summary of the Cancun Safeguards.

Compliance with the safeguards must be monitored and reported through a Safeguards Information System, which is a fundamental requirement for any payment by results project (PERNM/PJRM) in accordance with UNFCCC decision 2/CP7, CONAREDD+ resolution No. 8 the Climate, Community and Biodiversity Alliance (CCBA[35]), which created an additional standard for RPM considering non-carbon indicators to ensure greater social and environmental integrity of these projects[36] .

Among the criteria defined, the system must provide information in a transparent and accessible manner to all interested parties; be flexible to allow for improvements over time; offer information on all safeguards; be developed autonomously by the country; and take advantage of existing information systems.

[35] See CLIMATE PATTERNS. Home. Available at: https://www.climate-standards.org/ . Accessed on: 18 Feb. 2025.

[36] See SESSIN-DILASCIO, Karla; ROSSI, Charles Borges; SINISGALLI, Paulo Antônio de Almeida. The Institutionality of Environmental Justice in a REDD+ Compensation Project. Ambiente & Sociedade , v. e00188, 2024.

In Brazil, the development of the Safeguards Information System, SISREDD+, began in 2015, under the coordination of the Ministry of the Environment. To support this process, the Thematic Advisory Chamber on Safeguards was created within the National Commission for REDD+, made up of experts, representatives of civil society and public and private entities, with the responsibility of contributing the development of SISREDD+.

The state of Acre stands out for its pioneering approach to implementing safeguards for REDD+ projects. In 2011, Acre implemented a set of "Indicators" to monitor socio-environmental safeguards under the Environmental Services Incentive System (SISA). The indicators were created with the support of CCBA and Care International[37] .

The Indicadores Acrianos are structured into principles, criteria and specific indicators. The principles establish general guidelines, such as the promotion of environmental sustainability and respect for human rights. The criteria detail the conditions necessary to fulfill these principles, while the indicators provide quantitative and qualitative metrics to assess performance against the established criteria. This structure allows for comprehensive and accurate monitoring of the actions implemented

In order to operationalize the monitoring and transparency of safeguards, Acre has developed the Safeguards Information System. This system collects, organizes and makes available information on the implementation of socio-environmental safeguards, making it easier for civil society, government agencies and other interested parties to follow up.

37 See ACRE. Manual for Monitoring REDD+ Socio-environmental Safeguards in SISA. [Sl: sn], [sd].

Management of the system is coordinated by the Acre State Institute for Climate Change and Regulation of Environmental Services (IMC), which carries out periodic assessments and promotes public consultations to ensure social participation in the process.

6.2 PRIOR, FREE AND INFORMED CONSULTATION

Prior, Free and Informed Consultation (FPIC) is a fundamental right recognized internationally through Article 6 of Convention 169 of the International Labour Organization (ILO 169), and ratified in Brazil by Legislative Decree No. 143 of 2002.

The CPLI ensures that traditional, indigenous and extractive communities have the power to decide on projects, policies or initiatives that could directly or indirectly impact their territories and ways of life. In the context of REDD+, the CPLI is essential to ensure that these communities are protagonists in decisions involving the conservation and sustainable use of their forests (Figure 13).

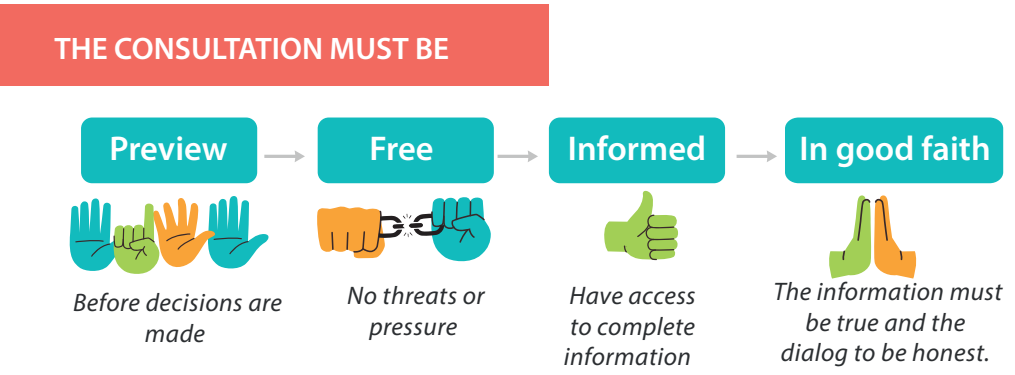


Figure 13. Free, Prior and Informed Consultation.

For the CPLI to be effective, it must respect fundamental principles, including the recognition of the self-determination of communities, which have the right to identify themselves as indigenous, extractivist or of any other cultural identity. This autonomy includes the ability to decide on the use of their territories, ways of life and cultural expressions, including the right to reject projects considered harmful[38] .

Consultation must take place before any decision or action is taken, ensuring that communities have sufficient time to deliberate; participation must be voluntary, without coercion, pressure or manipulation, reflecting the autonomy of communities. Communities must receive all the necessary information in a clear and accessible manner, including details of benefits, risks, responsibilities and long-term implications. The process must be conducted with honesty and transparency, avoiding the consultation being just a formal compliance. Recognizing the self-determination of communities, respecting their own consultation protocols and ensuring that the CPLI is an ongoing, transparent and culturally sensitive process are essential to ensuring the legitimacy and effectiveness of this right.

"Consultation" is the process by which communities are duly informed and involved in decision-making, and should take place before any final decision is made, respecting the time and protocols of each community involved (Box [9]). Consent" is the result of this process, reflecting the right of communities to agree or disagree an autonomous, free and informed manner[39] .

[38] See PRÉCOMA, A. et al. Right to Consultation and Prior, Free and Informed Consent: Do you know it? Cuiabá: OPAN, 2022.

[39] See BALDUINO, M.; AQUINO, P. REDD+ carbon projects in Extractive Reserves.

Box 9. What Law 15.042/2024 says about the rights of Indigenous Peoples and Traditional Communities on carbon

Art. 47: Indigenous peoples and traditional peoples and communities, through their representative entities in the respective territory, and those settled in agrarian reform projects are guaranteed the right to market CRVEs and carbon credits generated based on the development of projects in the territories they traditionally occupy, subject to compliance with socio-environmental safeguards, under the terms of the respective certification methodologies, and the following conditions:

I - in the case of communities of indigenous peoples and traditional peoples and communities:

a) consent resulting from free, prior and informed consultation, as provided for in International Labor Organization (ILO) Convention No. 169 on Indigenous and Tribal Peoples, under the terms of the consultation protocol or plan, if any, of the community consulted, with the community not being able to bear the costs of the process, with the entire consultation process being borne by the interested developer, the participation and supervision of the Ministry for Indigenous Peoples, the National Foundation for Indigenous Peoples (FUNAI) and the Thematic Chamber for Indigenous Populations and Traditional Communities (6th Chamber for Coordination and Review) of the Federal Public Prosecutor's Office, the bodies responsible for indigenous policy and guaranteeing the rights of indigenous peoples, is guaranteed.

The community's own consultation protocols must be respected, otherwise the process will be invalidated. , the CPLI should not be treated as an isolated event, but rather as an ongoing process involving community organizations and leaders, in partnership with proponents and other bodies, ensuring transparency, oversight by public rights bodies, and respect for local cultures. Materials and approaches used in consultations should be adapted to the realities and cultural specificities of each community, ensuring an inclusive, sensitive and legitimately conducted process (Box 10).

Box 10: To find out more about consultation mechanisms, here is a list of interesting publications:

https://amazonianativa.org.br/pub/ direito - a -consulta - e- consentimento - previo - livre - e-informado-voce-conhece/

Land of Rights: What is Prior Consultation?

www.youtube.com/watch ?v=ZlWAmnML9kk>

https://observatorio.direitosocioambiental.org/

The standard is the technical name given to the chosen certification methodology. The standard establishes the methodological parameters that define how much of the project area's carbon stock can actually be converted into carbon credits.

Accounting for the carbon equivalent avoided is defined based on an extensive process of biomass assessment of forest carbon stocks, compared to the baseline of the reference area, defined by the chosen certification methodology.

In general terms, the certifier measures the amount of carbon emissions avoided by reducing deforestation and forest degradation and issues a certificate proving that these emissions have been avoided. It is this certificate that can be sold as a carbon credit. The certificate is called a Verified Carbon Unit (VCU) and is issued by organizations that develop certification methodologies after the project has passed the certifier's analysis for non-state projects, Box 5.

6.3 Distribution of Benefits

Benefit sharing is an essential element in ensuring distributive justice in REDD+ projects. In general terms, it refers to the division of the gains from the payment for environmental services provided by the REDD+ project. Benefits can be distributed directly (transfer of financial resources, donation of materials, etc.) or indirectly (public policies, programs or actions),

for the project's beneficiaries[40]. Benefits can be tangible or intangible (e.g. training, information, etc.)[41].

Unlike Safeguards and Consultation, which have principles and guidelines established in international agreements and national and state regulations, although CONAREDD+ Resolution No. 8 establishes some guidelines for benefit sharing, and the recently approved

Law No. 15.042/2024 defines percentage criteria for the sharing of benefits for indigenous peoples and traditional communities (Box 11), the agreements on benefit sharing will depend on each project.

[40] "Beneficiaries are understood as the individuals, groups or organizations, intended targets or not, who benefit from the project intervention." See VIERGEVER, M.; SANTOS, P. Mid-Term Evaluation Report on the Effectiveness of the Amazon Fund: Study of the Distribution of Benefits of the Amazon Fund. 2019.

[41] See VIERGEVER, M.; SANTOS, P. Mid-Term Evaluation Report on the Effectiveness of the Amazon Fund: Study of the Distribution of Benefits of the Amazon Fund. 2019.

Table 11 – Regulations on benefit sharing

Resolution No. 8 CONAREDD+

Art. 2

VI - prioritize initiatives that benefit indigenous peoples, traditional peoples and communities and family farmers in the application of resources;

VII - facilitate access to resources, in a manner appropriate to their specific characteristics, by indigenous peoples, traditional peoples and communities and family farmers;

Law 15.042/2024

Art. 47 I - b) the inclusion of a contractual clause guaranteeing the fair and equitable distribution and participatory management of the monetary benefits derived from the co-marketing of carbon credits and CRVEs arising from the development of projects on the lands they traditionally occupy, deposited in a specific account, ensuring the right to at least 50% (fifty percent) of the carbon credits or CRVEs arising from GHG removal projects and the right to at least 70% (seventy percent) of the credits.

or CRVEs resulting from "REDD+ market approach" projects (PJRM and PPRM).

II - in the case of communities of indigenous peoples, traditional peoples and communities and agrarian reform settlers:

a) support for sustainable production activities, social protection, cultural valorization and territorial and environmental management, under the terms of the National Policy for Territorial and Environmental Management of Indigenous Lands, the National Policy for the Sustainable Development of Traditional Peoples and Communities and the National Agrarian Reform Policy;

b)the inclusion of a contractual clause that provides for compensation to indigenous communities, traditional peoples and communities and those settled in agrarian reform projects, for collective, material and immaterial damage resulting from projects and programs to generate CRVEs and carbon credits.

The Amazon Fund, for example, establishes the distribution of benefits based on the transfer of financial resources through calls for tenders, according to its own criteria of equity and social justice, including poverty reduction and gender equity as cross-cutting factors in the choice of projects.

There is also a need for the participation of indigenous communities, quilombolasriverside communities and small family farmers, prioritizing municipalities in the Legal Amazon.

The independent evaluation carried out by the Fund in 2019 identified that 62% of the resources were allocated to federal, state and municipal bodies to strengthen environmental management and inspection, and 38% to the third sector, including community associations, cooperatives NGOs focused on implementing sustainable development projects[42].

The REM/AC program uses the programmatic stock-flow methodology to establish the program's benefit sharing parameters. The programmatic stock-flow methodology (Figure 14) was developed in 2011 by researchers from the Amazon Environmental Research Institute (IPAM) as an option for sharing benefits from jurisdictional REDD+ programs in Brazil[43].

This methodology distributes the percentages of flow (e.g. deforestation and forest degradation) and stock (e.g. area of standing forest), in a given period of state deforestation reduction based on the national FREL, among the land categories in the jurisdiction, in order to define the percentages of benefit sharing to the groups linked to these categories.

[42] ee VIERGEVER, M.; SANTOS, P. Mid-Term Evaluation Report on the Effectiveness of the Amazon Fund: Study of the Distribution of Benefits of the Amazon Fund. 2019.

[43] See GUERRA, Raissa; MOUTINHO, Paulo. Challenges of sharing the benefits of REDD+ in the Amazon. Florestas , v. 11, n. 9, p. 1012, 2020..

categories, based on the definition of strategic programs linked to government public policies[44].

Following this methodology, REM/AC phase II, as PERNM, divided the distribution of benefits follows: 12% for Indigenous Territories, 25% for Sustainable Diversified Livestock, 33% for Sustainable Family Production Territories, 30% Strengthening SISA and REDD+ Mechanisms.

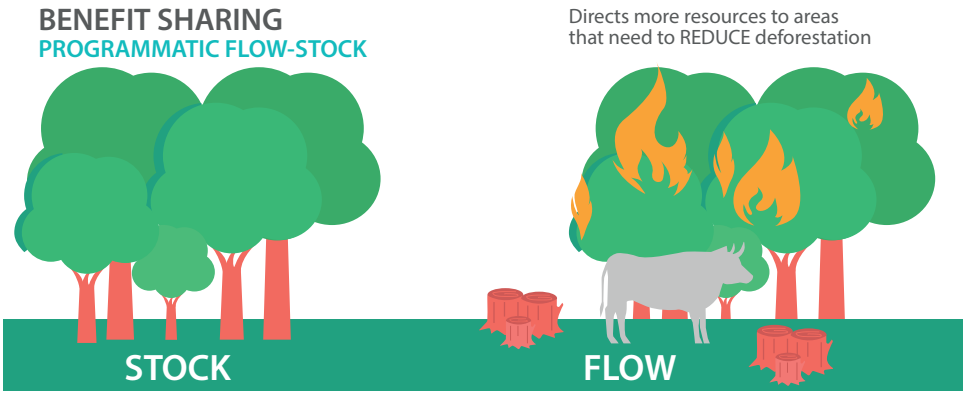


Figure 14. Illustration of the programmatic stock-flow methodology.
Source: Instituto Fronteiras (2024).

The programmatic stock-flow methodology directs resources to areas that must reduce deforestation and forest degradation, the Flow, increasing the additionality of the project, and to those areas of high forest cover responsible for maintaining the carbon stock, distributing resources based on the implementation of strategic programs related to the state's public policies.

[44] See GUERRA, Raissa; MOUTINHO, Paulo. Challenges of sharing the benefits of REDD+ in the Amazon. Florestas , v. 11, n. 9, p. 1012, 2020 and SESSIN-DILASCIO, Karla; ROSSI, Charles Borges; SINISGALLI, Paulo Antônio de Almeida. The Institutionality of Environmental Justice in a REDD+ Compensation Project. Ambiente & Sociedade , v. e00188, 2024.

There is great variation in the sharing of benefits in non-state REDD+ projects on private property (PPRM). Although there is a need to comply with socio-environmental safeguards, the absence of a framework of criteria and indicators for measuring the integrity of benefit sharing for communities directly impacted by these projects further exacerbates the possibility of improving this mechanism. Research points to the use of welfare persuasion mechanisms between carbon entrepreneurs and affected communities. The creation of the Climate, Community and Biodiversity (CCB) standard can be considered a step in this direction. The CCB standard creates additional criteria for REDD+ projects that are interested in voluntarily adopting strategies not aimed at increasing carbon stocks, but which contribute to improving the quality of life of communities and increasing biodiversity. By adopting the CCB standard, REDD+ entrepreneurs can sell their credits at an additional price, rewarding their good practices in non-carbon processes[45].

[45] See SESSIN-DILASCIO, Karla; ROSSI, Charles Borges; SINISGALLI, Paulo Antônio de Almeida. The Institutionality of Environmental Justice in a REDD+ Compensation Project. Ambiente & Sociedade, v. e00188, 2024.

7.CONCLUSION

In Brazil, there is a wide range of possible architectures for implementing REDD+. The absence of binding international agreements that fully recognize these mechanisms for compensation purposes, coupled with the lack of national regulations for the carbon market until 2024, has created uncertainty regarding the use of REDD+. At the same time, this gap has driven the adoption of the mechanism in non-formalized arenas, contributing to the multiplicity of institutional arrangements.

This publication seeks to clarify the different REDD+ architectures available in Brazil and how their institutional arrangements are operationalized in practice. To do this, we consolidate data from the literature, studies carried out by Fronteiras and the new regulations that have influenced the development of this mechanism.

In essence, REDD+ is a mechanism designed by the Global South to value efforts to maintain standing forests, reduce deforestation and forest degradation, and encourage sustainable management practices. Regardless of the type of project or program, it is essential to clearly define the holders of the rights to carbon credits. The process should start with the CPLI, ensuring that the communities involved have enough time to deliberate and decide autonomously and voluntarily, without coercion or manipulation.

Once the project has started, it is essential to ensure continuous monitoring of compliance with the safeguards throughout all its stages - from validation and verification to implementation over the years. The benefit-sharing process must take place after the sale of the

credits or through the formalization of financial commitments, allowing for an equitable distribution of the resources generated (Figure 15).

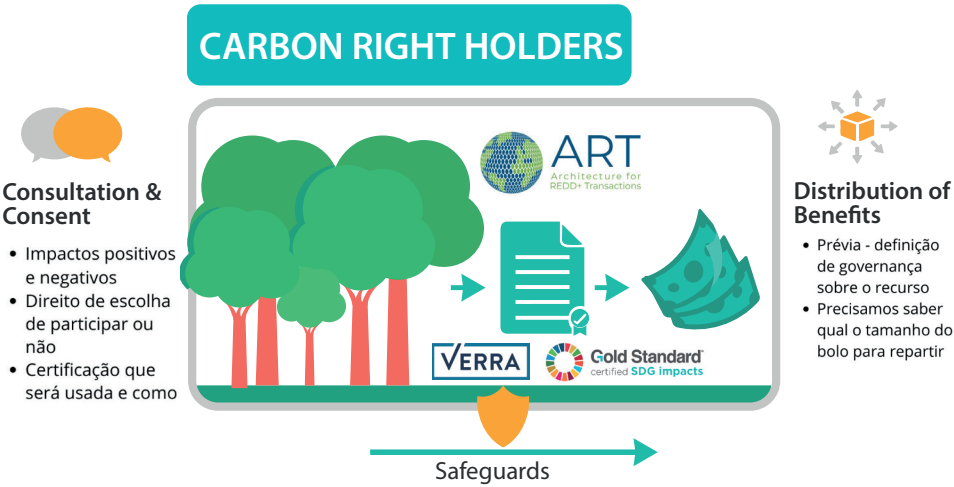


Figure 15. Summary of the REDD+ project/program process.

Non-state REDD+ projects must follow the methodology of the standard chosen for certifying their carbon credits, following basic guidelines for consultation, compliance with safeguards and benefit sharing. Information on these projects must be made available on the transparency platform of the institution responsible for approving the project and issuing the project's VCU, as well as leaving open channels for complaints. Non-state projects must undergo periodic third-party audits that independently assess the project's results (MRV mechanism), informing certification, which must decide whether to renew the VCU contract, pause the project for compliance or cancel its registration.

Projects/programs run by state entities, which use the payment-by--results methodology and receive donations for their efforts in the

past reduction in deforestation, such as the Amazon Fund and the REM Acre program, establish their own methodologies for sharing benefits, consultation and monitoring safeguards.

The Ministry of the Environment is responsible for consolidating the information on these projects on the InfoHub Brasil platform, in order to avoid double counting the credits derived from payments by results. It is important that state programs follow the guidelines indicated for good public management, considering the creation and maintenance of mechanisms for social participation and control, transparency and accountability of these projects.

In this way, the diversity of REDD+ architectures in Brazil reflects both the challenges and the opportunities of this mechanism in the national context. Regulatory evolution, the implementation of robust safeguards and the strengthening of transparency are determining factors for the consolidation of REDD+ as an effective instrument in the fight against deforestation and in valuing the ecosystem services of Brazilian forests.

REFERENCES

ACRE. *Manual de Monitoramento das Salvaguardas Socioambientais de REDD+ no SISA.* [Sl: sn], [sd].

ALIANÇA, Floresta Tropical. *Relatório de avaliação para validação do Projeto de Carbono Florestal Suruí-Brasil.* Richmond: Rainforest Alliance, 2012.

ANGELSEN, Arild (Ed.). *Avançando com REDD: questões, opções e implicações.* Cifor, 2008.

ARTREDD. *Árvores.* Disponível em: https://www.artredd.org/trees/ . Acesso em: 03 dez. 2024.

ATMADJA, Stibniati S. et al. *Como os projetos REDD+ adicionais para as metas do Acordo de Paris? Cartas de Pesquisa Ambiental* , v. 17, n. 4, pág. 044038, 2022.

BALDUINO, M.; AQUINO, P. *Projetos de carbono REDD+ em Reservas Extrativistas.* Brasília: Instituto de Estudos Amazônicos - IEA, 2024.

BRASIL. Ministério da Ciência, Tecnologia, Inovações e Comunicações (MCTIC). Secretaria de Políticas e Programas de Pesquisa e Desenvolvimento (SEPED). Coordenação-Geral de Clima (CGCL). *Portaria SEPED/MCTI nº 3, de 10 de fevereiro de 2015.* Disponível em: https://antigo.mctic.gov.br/mctic/opencms/legislacao/portarias/migracao/Portaria_SEPEDMCTI_n_3_de_10022015.html . Acesso em: 13 fev. 2025.

BRASIL. Serviço Florestal Brasileiro. *Os biomas e suas florestas.* Disponível em: https://snif.florestal.gov.br/pt-br/os-biomas-e-suas-florestas . Acesso em: 13 fev. 2025.

BRASIL. *Lei nº 15.042, de 11 de dezembro de 2024.* Disponível em: https://www2.camara.leg.br/legin/fed/lei/2024/lei-15042-11-dezembro-2024-796690-publicacaooriginal-173745-pl.html . Acesso em: 13 fev. 2025.

COALIZÃO DA FOLHA. *Lar.* Disponível em: https://www.leafcoalition.org/pt/home/ . Acesso em: 14 fev. 2025.

COLETIVO PROTEJA. *Clima.* Disponível em: https://coletivoproteja.org/clima/ . Acesso em: 24 fev. 2025.

CONAREDD+. *Resoluções da CONAREDD.* Disponível em: http://redd.mma.gov.br/pt/resolucoes-da-conaredd . Acesso em: 07 mar. 2025.

CORREA, Juliano; VAN DER HOFF, Richard; RAJÃO, Raoni. *Fundo Amazônia 10 anos depois: lições do maior programa REDD+ do mundo. Florestas* , v. 10, n. 3, p. 272, 2019.

ESCOLA KIDS. *Ciclo do carbono.* Disponível em: https://escolakids.uol.com.br/-ciencias/ciclo-do-carbono.htm . Acesso em: 13 fev. 2025.

GIZ. *10 Anos de Experiência do Programa REM – REDD Early Movers: Lições do Acre, Mato Grosso (Brasil), Colômbia e Equador.* Brasília: GIZ & KFW, 2022.

GUERRA, Raissa; MOUTINHO, Paulo. *Desafios da repartição dos benefícios do REDD+ na Amazônia. Florestas* , v. 9, pág. 1012, 2020.

MAHONEY, James; THELEN, Kathleen (Ed.). *Explicando a mudança institucional: Ambiguidade, agência e poder.* Imprensa da Universidade de Cambridge, 2009.

MINISTÉRIO DO MEIO AMBIENTE (MMA). *Infohub Brasil.* Disponível em: https://infohubbrasil.mma.gov.br/pt/ . Acesso em: 07 mar. 2025.

PADRÕES CLIMÁTICOS. *Lar.* Disponível em: https://www.climate-standards.org/ . Acesso em: 18 fev. 2025.

PRÉCOMA, A. et al. *Direito à Consulta e Consentimento Prévio, Livre e Informado: Você conhece?* Cuiabá: OPAN, 2022.

SESSIN-DILASCIO, Karla; BORGES-ROSSI, Charles; SINISGALLI, Paulo. *Descobrindo REDD Plus no Brasil. Sustentabilidade* , v. 16, n. 13, pág. 5409, 2024.

SESSIN-DILASCIO, Karla; ROSSI, Charles Borges; SINISGALLI, Paulo Antônio de Almeida. *A Institucionalidade da Justiça Ambiental em Projeto de Compensação de REDD+. Ambiente & Sociedade* , v. e00188, 2024.

TSAI, Davi et al. *Análise das Emissões de Gases de Efeito Estufa e Suas Implicações Para as Metas Climáticas do Brasil 1970–2022.* Sistema de Estimativas de Emissões e Remoções de Gases de Efeito Estufa (SEEG), Piracicaba, Brasil, 2023.

VERRA. *Estrutura metodológica REDD (REDD-MF) v1.6.* 2024. Disponível em:

2023.

VERRA. *Estrutura metodológica REDD (REDD-MF) v1.6.* 2024. Disponível em: https://verra.org/methodologies/redd-methodology-framework-reddmf-v1-6/ . Acesso em: 07 mar. 2025.

VERRA. *Projetos certificados e unidades de carbono verificadas.* 2022. Disponível em: https://registry.verra.org/app/projectDetail/VCS/1113 . Acesso em: 07 mar. 2025.

VIERGEVER, M.; SANTOS, P. *Relatório de Avaliação de Meio Termo da Efetividade do Fundo Amazônia: Estudo de Distribuição de Benefícios do Fundo Amazônia.* 2019.

OESTE, Thales AP; BOMFIM, Bárbara; HAYA, Barbara K. *Problemas metodológicos com linhas de base de desmatamento comprometem a integridade das compensações de carbono do REDD+. Mudança Ambiental Global* , v. 87, p. 102863, 2024.


Instituto
Fronteiras