

Challenges for the implementation of the jurisdictional REDD+ in the Brazilian state of Amazonas

Desafios para implementação de REDD+ jurisdicional no Amazonas

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ABSTRACT

The forestry sectors of developing countries can contribute to the fight against climate change through financial negotiations, which include the REDD+ mechanism. The jurisdictional REDD+ (J-REDD+) approach has emerged as an option for large countries, such as Brazil, which have profound regional idiosyncrasies that can influence the dynamics of the implementation of a REDD+ system. The study analyzes the implementation of a J-REDD+ system in the Brazilian state of Amazonas, between 2005 and 2022, based on the analysis of official documents and academic studies. The data were used to compile a SWOT matrix, which was employed to identify the strengths, weaknesses, opportunities, and threats involved in implementing the J-REDD+ in the state. This analysis revealed that the principal forces include public policy, the combat of deforestation, governance, monitoring, and the targets for reducing deforestation rates. The primary weaknesses include the lack of a state REDD+ plan, recent increases in deforestation rates, strategic challenges, the limited representation of traditional and indigenous peoples on advisory councils, and the lack of adequate transparency mechanisms. External opportunities lie in the potential for increasing the funding for projects, although the external threats include a lack of continuous funding, changes in the composition of working bodies, and the discontinuous nature of local government programs. These findings indicate that implementation of J-REDD+ at both state levels will be crucial to ensure that this approach provides an effective mechanism for the mitigation of climate change, as well as achieving present and future goals for conservation and sustainable development.

Keywords: deforestation; governance; plan; SWOT.

RESUMO

O setor florestal em países em desenvolvimento pode contribuir para combater a mudança climática através de negociações financeiras, sendo o mecanismo de REDD+ uma abordagem proeminente. A abordagem de REDD+ jurisdicional (J-REDD+) surgiu para países de grandes dimensões como o Brasil, cujas particularidades regionais ou estaduais podem influenciar na dinâmica de implementação do REDD+. Este estudo analisa a implementação do J-REDD+ no Amazonas (AM) de 2005 a 2022. Usando-se análises de documentos oficiais e estudos acadêmicos, uma matriz SWOT foi criada para identificação de forças, fraquezas, oportunidades e ameaças na implementação do J-REDD+. Foi percebido que as forças incluem políticas públicas, combate ao desmatamento, governança, monitoramento e metas de redução do desmatamento. As fraquezas englobam a falta de um plano estadual de REDD+, aumento recente de desmatamento, desafios estratégicos, representatividade limitada de PIPCTs em colegiados e mecanismo de transparência. Externamente, a oportunidade reside em financiamento crescente para projetos. No entanto, as ameaças incluem a falta de financiamento continuado, mudança na constituição de equipes e a descontinuidade dos programas do governo local. Concluiu-se que a implementação do J-REDD+ em ambas as escalas é crucial para que esse mecanismo contribua efetivamente para a mitigação da mudança climática, atendendo às necessidades presentes e futuras.

Palavras-chave: desmatamento; governança; plano; SWOT.

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Introduction

Human activities, those responsible for the emission of greenhouse gases, are certainly responsible for global warming, which has led to an increase of 1.1°C in the planet's mean temperature in recent years (IPCC, 2023). The most perceptible consequence of climate change has been the increase in the frequency of extreme meteorological events, which has highlighted the urgency of mitigatory measures, and drawn attention increasingly toward the forestry sector, which has considerable potential for the limitation of greenhouse gas emissions.

The control of deforestation and the promotion of reforestation are both promising strategies for the reduction of greenhouse gas emissions. Regarding the first strategy, it is important to note that Brazil holds more than half of the tropical forests in the Amazon region. With an area of more than one and a half million square kilometers, the state of Amazonas is Brazil's largest, and most forested, given that approximately 97% of its total area is still covered with well-preserved native forest (Melgueiro, 2020; SEMA, 2023). However, the region is suffering increasing pressure from anthropogenic impacts and the progressive expansion of deforestation. The critical areas are concentrated in the extreme south of the state and in the metropolitan zone of the state capital, Manaus, which together accounted for 82% of the state's total deforestation between 2008 and 2022 (SEMA, 2022a).

The potential contribution of the forestry sector to the resolution of climate-related impacts, in developing countries, depends on the adoption of a range of functional mechanisms, including financial considerations. The most important of these mechanisms is the Reduction of Emissions from Deforestation and Forest Degradation — REDD+ (Costa, 2017). Proposals for REDD+ were discussed globally between 2005 and 2010 and gained considerable momentum in the context of the United Nations Framework Convention on Climate Change (UNFCCC), in which Brazil has a significant role.

In 2013, the Warsaw Framework permitted payments for REDD+ results (Abreu, 2021). For this, UNFCCC stipulated four prerequisites for developing countries: 1. the existence of a robust and transparent national system for the regulation of the country's forests that permits the reliable monitoring and reporting of REDD+ activities (with subnational monitoring as an interim measure); 2. the development of a national strategy or action plan; 3. the submission of a national reference level of forestry emissions or forest reference level (or, as an interim measure, the corresponding subnational levels); and 4. the existence of an information system on the implementation of REDD+ safeguards (Gomes, 2017). The UNFCCC established these prerequisites to enable countries to become part of this institution.

Brazil was the first country to satisfy the prerequisites of the Warsaw Framework and to have its REDD+ results recognized

in full by the UNFCCC. For this, a National REDD+ Committee (CONAREDD+) was created to establish guidelines for the collection of resources from the payments for the results of the REDD+. One of the attributions of the CONAREDD+, which was established by Federal Decree no. 10,144/2019 (Brasil, 2019), is to define the rules of eligibility of the states of the Brazilian Legal Amazonia political division, to collect these resources. In recognition of the role of the Amazonian states, CONAREDD+ allocates the limits for the collection of the payments for the results of the REDD+ in Legal Amazonia between the states that make up this region and the federal government. In this case, subnational entities, and not only federal institutions, are eligible to collect payments for the results of the REDD+.

Over the past decade, the national REDD+ programs were consolidated following the dissemination of local projects (but not J-REDD+). At the same time, given the delayed implementation and reduced coverage of the national programs, subnational governments, such as those of the states of the Brazilian Legal Amazonia region began to take the initiative through a J-REDD+ approach. This new J-REDD+ model involves the application of wide-reaching government initiatives for the regulation of land use throughout a jurisdiction, based on the experience obtained with the REDD+, although it was also, in part, a reaction to the widespread criticism of the projects in the initial activities of the REDD+ (Wunder et al., 2020).

The present study focused on the initiatives of the government of Amazonas for the implementation of the J-REDD+ in this state. In the context of the carbon markets, the jurisdiction is the physical area within which the goals for the reduction of deforestation and carbon projects are established. The local government has the power or competence to establish carbon programs and projects within this jurisdiction (Forest Trends, 2019).

In the present study, REDD+ is a public policy of Amazonas state that is currently in its implementation phase. Mendoza (2023) defined public policy as any initiative implemented by the state authorities that aims to improve social well-being through the application of public resources for the resolution of a problem in the public sphere, most rationally and effectively possible through systematic government action. In particular, the present study analyzes the challenges for the implementation of a jurisdictional REDD+ in Amazonas state, based on the data available for the period between 2005 and 2022.

Materials and Methods

The present study is based on the assessment of a specific state-level public policy at a given point in its life cycle. Mendoza (2023) defines the beginning of the life cycle of a public policy as an individual problem, which eventually transforms itself into a public or social problem. Faced with this transformation, the government begins to

establish a structure, through which it creates a set of workable solutions that, after their systematic assessment, are applied to the decision-making process. This is followed by the implementation of the decision that was made and the evaluation of its efficacy. The present study is based on a critical review of the ongoing implementation of REDD+ in the Brazilian state of Amazonas, focusing specifically on the period between 2005 and 2022. The research was based on a comprehensive literature search, which included public documents, to support a systematic description of the evolution of the J-REDD+ and its implementation in the state of Amazonas, including academic papers, legal documents, and state decrees, which allowed for the comprehensive contextualization of the process.

It is important to note that Resolution no. 6, of July 6th, 2017 (MMA, 2017), of the National Committee for REDD+, which establishes the eligibility of the Amazonian states and federal entities, determined that: 1. each state must demonstrate that it has the necessary infrastructure to support participative, operational, and transparent governance, for the implementation of the action plans necessary for the prevention and control of deforestation or an alternative set of policies that will ensure the results and the fulfillment of the safeguards of the REDD+; and 2. the resolution also highlights the importance of the ability of each interested party to demonstrate its capacity to provide the mechanisms of transparency necessary to guarantee the disclosure of information and accountability about its receipt of resources, safeguards and the performance of the REDD+, and the indices of the initiatives supported by the resources provided as payments for the results of the REDD+. These conditions were verified in fine detail to establish a thorough understanding of the evolution of the process of the implementation of the J-REDD+ in Amazonas state.

The study subsequently evaluated a variety of the modalities of the REDD+ in Amazonas state, considering each component of the REDD+ acronym, i.e., Reducing Emissions from Deforestation and Forest Degradation, Conserving Forest Reserves, Managing Forests Sustainably, and Increasing Carbon Reserves, as well as their contribution to the generation of carbon credits, whether in the form of stocks or active flow. Finally, the SWOT tool was employed to identify the strong and weak points, and the opportunities and threats involved in the implementation of the J-REDD+ in the state of Amazonas. The concept of the SWOT matrix and some of the studies that have applied this approach are presented below.

The SWOT matrix

A SWOT matrix was used to identify the internal and external factors that have influenced the implementation of the J-REDD+ in the Brazilian state of Amazonas. The SWOT matrix is a classical administrative tool (Mulenga and Oeba, 2019), which represents the strong (S) and weak (W) internal points of the organization, as well as its external opportunities (O) and threats (T). The materials and methods employed in the present study are presented below.

The SWOT matrix used to assess the REDD+ policy implemented in the Brazilian state of Amazonas was compiled based on the studies and documents selected from the literature search and other documents, which provided the references, information, and data used as the input for the matrix (Tables 1 and 2). The documents used in the present study supported the description of the principal legal features of the public policy associated with the implementation of the J-REDD+ in Amazonas state.

Table 1 – A selection of the most important studies that supported the discussion of the processes verified in the present study.

Authors	Title of the study	Year of publication
Nzunda and Manyanda	A SWOT analysis of community-based forest management policy as a basis for REDD+ in Tanzania	2023
Abdoun	Incentives for Reforestation and Forest Plantations Option, under the National Strategy of REDD+Program in Sudan	2020
Bamwesigye, Doli and Hlavackova	REDD+: An Analysis of Initiatives in East Africa Amidst Increasing Deforestation	2020
Mulenga and Oeba	An evaluation of the determinants of the conception and implementation of the MDL and REDD+ in Africa	2019
Gomes	Challenges for the implementation of REDD+ in Brazil: an analysis of the threats and opportunities	2017

Table 2 – A selection of the documents used in the present study.

Legal framework	Description	Year
State Law no. 4,266/2015	State Policy on Environmental Services	2015
State Decree no. 44,968/2021	Regulation of the State Policy on Environmental Services and the State Fund for climate change, environmental conservation, and environmental services (FEMUCS)	2021
State Decree no. 46,596/2022	On the regulation of the “credits allocated via CONAREDD+”, presented at the United Nations Conference on Climate Change — COP-27, and other arrangements	2022

Results and Discussion

Eligibility of the state of Amazonas for the REDD+ proposed by CONAREDD+

Amazonas state was one of the pioneers in the creation and implementation of policies designed to combat climate change and provide incentives for sustainable development in Brazil. Amazonas was the first Brazilian state to establish a Payment for Environmental Services (PES) program related to deforestation (the Forest Grant Program, which is now known as the Forest Guardians Program), which was implemented through State Decree no. 26,958/2007 (Amazonas, 2007a), and is currently regulated by State Decree no. 44,968/2021 (Amazonas, 2021). In 2015, Amazonas state established its Environmental Services Policy and Environmental Services Management System, through State Law no. 4,266/2015 (Amazonas, 2015), which was subsequently regulated by Decree no. 44,968/2021 (Amazonas, 2021).

This initial section highlights the efforts of the state to address the two central prerequisites defined by the CONAREDD+, and thus achieve the recognition of its vintage credits through 1. operational, participative, and transparent governance, and 2. transparency in the disclosure of information and accounting.

Participative governance — CONAREDD+ defines participative governance as an approach that involves all the different sectors of society, including representatives of Indigenous peoples and traditional communities. In this context, Amazonas has its State Environment Council (CEMAAM), which is the organ responsible for the collective deliberation and standardization of the state's environment policy, which is regulated by paragraphs 1 and 2 of Article 220 of the state constitution, created by State Law no. 2,985 of October 18th, 2005 (Amazonas, 2005), and revoked by Complementary Law no. 187 of April 25th, 2018 (Amazonas, 2018). The other two consultative boards that are relevant to this policy are the Council for the Sustainable Development of Traditional Peoples and Communities — CDSPCT, which was created by State Law no. 3,525/2010 (Amazonas, 2010), as an integral component of the organizational structure of the then state Secretariat for the Environment and Sustainable Development (SDS) and the Amazonas State Forum on Global Climate Change, Biodiversity, and Environmental Services (FAMC), which was established by State Decree no. 28,390, of February 17th, 2009 (Amazonas, 2009).

The participation of entities that represent both Indigenous peoples and traditional peoples and communities (collectively, PIPCTs) is guaranteed on the different state councils, in particular the Sustainable Development Council of Traditional Peoples and Communities — CDSCPT, as would be expected (Table 3). While the PIPCTs occupy 42% of the seats on the CDSCPT, they hold only around 8% of the places on the CEMAAM and FAMC. Given their deliberative function, councils such as CEMAAM must have proportionately more representatives of the PIPCTs, which are true guardians of the forest.

Table 3 – Composition of the governance and guarantees of the safeguards of the REDD+ in Amazonas state.

Type of institution	CEMAAM	CDSCPT	FAMC
Federal	4	4	4
State	7	10	14
Municipal	3	0	3
Institutions of Science and Technology	5	3	4
Association of Employers	3	0	2
Professional Association	4	0	0
Environmental Organization	6	5	8
Traditional peoples and communities	2	11	2
Indigenous peoples	1	5	1
Total	35	38	38
All PIPCTs	3	16	3
PIPCT (%)	8.6	42.1	7.9

The initial data from the Amazonia Deforestation Monitoring Project (PRODES) for the period between 2008 and 2022 show that deforestation in Amazonas state occurred primarily on federal land (36%), settlements (29%), and unregistered areas (22%). During the same period, only 3% of the total deforestation involved Indigenous lands, with 2% each in state and federal protected areas (Amazonas, 2023).

Operational Governance — This criterion requires that the governance bodies that implement policies maintain an active calendar of meetings. The CEMAAM, CDSPCT, and FAMC all have schedules of both ordinary and extraordinary meetings in public sessions, which are summoned in advance and require a quorum of at least half of the official members of each council (SEMA, 2022b).

Transparent Governance — The transparency of governance is based on the availability, through the electronic media, of all the information necessary for decision-making, the formulation of strategies, and the execution of the actions involved in the implementation and monitoring of the policies related to the REDD+. In particular, the minutes of all the council meetings are available on the official site of the SEMA.

Mechanisms of Transparency — According to this criterion, each interested party should have or make available a mechanism of transparency for the disclosure of information and accounting on 1. Safeguards; 2. The collection and application of resources; and 3. Performance, with the respective indices referring specifically to the initiatives supported by the resources provided by the payments for the results of the REDD+. It is important to note here that CONAREDD+ has not demanded the creation of a system of safeguards, requiring only that the REDD+ safeguards are being respected (Abreu, 2021). Up to now, the state has not implemented the SISREDD+ safeguard system or a Measurement, Reporting, and Verification (MRV) system, which are essential for the monitoring of the implementation of a REDD+.

to avoid duplicate accounting and ensuring the integrity of the carbon credits produced by the state. The Amazonas state government uses the public databases of the PRODES and DETER systems to monitor deforestation and forest degradation, while the accounting of the credits is conducted at a national level.

While CONAREDD+ Resolution no. 5 of October 29th (MMA, 2021), conferred eligibility on Amazonas, it also recommended that the state should reinforce the monitoring of safeguards, guarantee the full participation of the PIPCTs, and enhance policies for the effective deployment of a REDD+ Safeguard Information System (SISREDD+) in line with the national REDD+ Strategy (ENREDD+) for the implementation and monitoring of the state plan for the Prevention and Combat of Deforestation and Wildfires — PPCDQ.

This resolution recognizes a limit for the collection, by the state, of payments for its results in the reduction of emissions produced by deforestation, set at 809,670,198.54 tCO₂e by CONAREDD+ Resolution no. 6 of July 6th (MMA, 2017). This limit was made official by State Decree no. 46,596/2022 (Amazonas, 2022). The credits accumulated in 2006–2010 and 2011–2015 represent a potential financial resource that could be obtained through the sale of these credits, with the principal objective of kickstarting a more sustainable model of development in the state. However, before it can realize any such transaction, the state will need to satisfy the corresponding legal guidelines and establish an efficient accounting system, considering the diversity of the ongoing projects in the region. The analysis presented below will discuss how each component of the REDD+ has been developed in Amazonas state.

The performance of the Amazonas state in each of the components of the REDD+ mechanism

The REDD+ initiative presents the state with many opportunities to combat deforestation and forest degradation, while obtaining financial resources for its climate agenda, to develop a prosperous, socially just, and environmentally sustainable economy. This section evaluates the implementation of the economic mechanism of compensation for offsetting deforestation (REDD+) and verifies how each component of the REDD+ acronym (Reducing Emissions from Deforestation and Forest Degradation, Conserving Forest Reserves, Managing Forests Sustainably, and Increasing Carbon Reserves) contributes to the control of the emissions of greenhouse gases and how the J-REDD+ initiative of Amazonas state supports efforts to reduce its emissions.

The reduction of emissions from deforestation and forest degradation — In 2004, the Brazilian federal government launched its Action Plan for the Prevention and Control of Deforestation in Legal Amazonia (PPCDAM), with the principal aim of restricting the advance of deforestation in the region. In the federal sphere, the plan is currently in its fifth phase, while the state plan, the Plan for the Prevention and Control of Deforestation in Amazonas State (PPCD-AM), was developed in four phases.

In the 1st phase (2009), the objective of the plan was to strengthen environmental governance and promote the sustainable use of natu-

ral resources. The 2nd phase (2012–2015) involved the evaluation of the scope of the proposed measures, with a mean execution of 49%, including fulfillment of 43% in territorial regulation, 39% in environmental control, and 46% in the promotion of sustainable productive activities. The 3rd phase (2020–2022) had a mean implementation of 43%, with the fulfillment of 17, 66, and 47%, respectively, on these strategic axes. Other measures that were not mentioned here include the zoning of fishery agreements, the environmental registration of rural properties, and the socio-biodiversity productive chain.

In the fourth phase of the PPCDQAM (2023–2025) (Amazonas, 2023a), the goal for the reduction of deforestation is 10%, based on the level accumulated in 2020–2022. This new phase was the first to establish a goal for the reduction of forest degradation by 10%, based on the results of the period between 2020 and 2022. To achieve these objectives, a timetable for the Plan for the Prevention and Control of Deforestation and Wildfires in the state of Amazonas can be proposed, based on three axes: territorial regulation; environmental monitoring, command, and control, and bioeconomics and alternative sustainable economic activities. The extreme southern portion of the state has been earmarked as a priority area for the combat of deforestation and forest degradation (Amazonas, 2023a). It is hoped that this plan can contribute effectively to the reduction of deforestation and forest degradation, and, in turn, to the generation of carbon credits.

It is important to note here that State Law no. 4,266/2015 (Amazonas, 2015) mandated the creation of the state REDD+ plan within a deadline of 180 days. This plan establishes important goals and measurable actions, promotes transparency, and allows the general society to monitor the progress in the reduction of the emissions of greenhouse gases and the conservation of the forest. This also helps to hold the government and the other interested parties responsible for their actions. As shown below, the state's conservation units are presented as a means of fighting deforestation and, in turn, reinforcing carbon stocks.

Conservation of the Forest — The state of Amazonas has its system of conservation units (SEUC), which is regulated by State Law no. 53/2007 (Amazonas, 2007b). The SEUC establishes the norms and criteria for the creation, management, and evaluation of the state's protected areas. Amazonas currently has a total of 42 conservation units, which include both fully protected (n=8) and sustainable-use areas (n=34), which contribute to the conservation of its forests, as well as the sustainable development of the region (SEMA, 2022c). As mentioned above, the state-protected areas have made a significant contribution to the control of deforestation. Forestry management is one other means of generating carbon credits, which can also be supported by the state policy on concessions, which is currently being implemented in Amazonas state.

Sustainable forest management — In Brazil, article 14 of Provisional Measure no. 1,151, of December 26th, 2022 (Brasil, 2022), states that “Concessions in conservation units may include in their objectives the right to develop and sell carbon credits and environmental services”.

Before this, there was no legal framework for the exploitation of carbon credits within areas of forestry concessions.

The forestry concession in Amazonas state was established by State Law no. 4,415/2016 (Amazonas, 2016a) for the sustainable management of state public forests. State Laws 4,266/2015 and 4,406/2016 (Amazonas, 2015, 2016b) also improved the potential for the improvement of sustainable development and environmental regulation, benefitting traditional populations, and directing the rational use of forest resources.

There is also a network of public state forests (Canutama, Maués, Manicoré, Apuí, Sucunduri, Aripuanã, Rio Urubu, and Tapauá), which are available for concession, with a total area of 2,596,347.41 hectares (SEMA, 2022d). In this context, it will be essential for Amazonas state to create the legal framework necessary to allow the companies that win the concessions to sell the carbon credits produced by these concessions. The assessment presented below also verified how the state approaches the question of carbon stocks.

Carbon stocks — According to data from Brazil's Institute for Space Research (INPE, 2023), deforestation increased by approximately 236.4% in Amazonas state between 2005 and 2022. Up to 2014, there was a mean reduction in deforestation, while, from 2015 onward, there was a mean increase of 25.3% in deforestation rates, with peak increases in 2016 (58.6%) and 2021 (52.5%), in comparison with the preceding year.

In 2021, the greatest total area of deforestation was recorded in the municipality of Lábrea, with approximately 6,118.5 km², followed by Apuí, with 3,505.6 km², and the municipality of Boca do Acre, with 3,111.7 km². All three of these municipalities are listed as top priority for the combat of deforestation by the Brazilian Environment Ministry, given the exponential growth in their deforestation rates from 2019 onward. In Lábrea there was a major increase in illegal logging, which was facilitated by the reduction of investment by the government in resources for environmental surveillance (Amazonas, 2020).

Despite the progressive increase in deforestation and greenhouse gas emissions in Amazonas state, there are projects with the potential for effective mitigation. The Winrock International study of 2012 — “The Trajectories of Decarbonization” — highlighted seven priority actions for Agriculture, Forests, and Other Land Use (AFOLU): forest protection, efficiency in land use, the expansion of forests, commercial reforestation, the reduction of forest fires, sustainable forestry management, and forest products. With these measures, the reduction in the emission of greenhouse gases in Amazonas state could reach 44 TgCO₂ by 2030 and 209 TgCO₂ by 2050, primarily through the control of deforestation, the expansion of the total area of forest, and sustainable management. This could also increase the amount of carbon credits.

Approximately 97% of the forest cover of Amazonas State is still completely preserved, and SEMA implements constant measures to ensure the continued preservation of this area and impede deforestation (SEMA, 2023). Amazonas has a potential REDD+ of 325–480 MtCO₂ for the period between 2016 and 2030. Based on the reference value of

US\$ 5/tCO₂, provided by the Amazonia Fund, the total volume of the reduction of emissions estimated for Amazonas could potentially generate a return of the order of US\$1.6–2.4 billion for the state between 2016 and 2030 (IDESAM, 2020).

It is also important to note here that Amazonas state is also part of the planned LEAF global coalition, which brings governments and businesses together to finance the conservation of tropical forests. The state adhered to the plan in 2021 with the support from the non-profit organization Emergent (<https://emergentclimate.com/>), the body that is coordinating the coalition. Amazonas' proposal was selected based on the state's capacity to address the Art-Trees prerequisites. Financial resources are essential to achieve these prerequisites, and one potential way of obtaining this financial support for the jurisdictional REDD+ would be through the sale of vintage credits or the implementation of the projects proposed in State Decree no. 44,968/2021 (Amazonas, 2021). This decree established the types of agents able to execute the environmental services of the projects of the Amazonas State Environmental Services Management System. In 2022, nine agents were recognized and will be able to participate in the REDD+ proposal public call (Amazonas, 2023b).

Private sector financing is viable for REDD+ projects, which can provide access to more manageable sources of financing (Bamwesigye et al., 2020). Even so, spatial leakage may still be a challenge, in the case of local projects, although jurisdictional initiatives have certain advantages in the containment of leakage (Art Trees, 2023). An additional problem arises in the project baselines, which are derived from the extrapolation of historic means or trends of deforestation, which are typically applied to a reference area within the scope of the project. These baselines can be manipulated to maximize the compensation paid out. One potential solution is the adoption of transparent jurisdictional baselines that are predefined by the state for the projects (West et al., 2023). The next section describes and discusses the factors and conditions that were identified as forces, weaknesses, opportunities, and threats for the implementation of the J-REDD+ in Amazonas state.

The SWOT matrix: the internal and external factors that influence the implementation of REDD+ in the Brazilian state of Amazonas

Jurisdictional programs were created for diverse types of land use, involving a range of interested parties, with the objective of implementation by the state. The advantages of this strategy include economies of scale, an effective approach to the problem of leakage, incentives for the participation of local governments in broad political dialogs, and the stimulation of inter-institutional cooperation. These programs offer manageable scalability, which is especially useful for large countries, providing tests of innovation and more rapid results, which accelerate national initiatives.

The jurisdictional approach has several disadvantages, however, including: 1. Complex governance structures are required to coordinate

the varying types of land use and the interested parties, which must encompass areas ranging from conservation units and indigenous territories to private rural properties, which is, nevertheless, consistent with the reality of the country; 2. The risks of interruption due to changes in the subnational legislation, weak institutions or related political conflicts; and 3. The lack of capacity, in terms of personnel and technological and financial resources, which impact the implementation of the approach (Gomes, 2017). In Sudan, Abdoun (2020) noted that the areas cultivated annually for the restoration of degraded zones and the related acquisition of carbon credits were well below the strategic goals, due primarily to the lack of financial input from international sources.

In the case of the internal factors (Chart 1), the forces involved in the process of the implementation of the J-REDD+ in Amazonas state include public policy, the combat of deforestation and forest degradation, monitoring, voluntary goals for the reduction of deforestation, and governance. In the specific context of governance, Nzunda and Manyanda (2023) highlighted the importance of the existence of robust government structures in Tanzania, which permitted the efficient community-level administration of forestry management and the REDD+ approach.

In Brazil, Borges (2011) determined that the country has some forces that were also confirmed by the findings of the present study, such as the state's policies and plans for deforestation, its excellent technological capacity for the surveillance of forest cover, and voluntary goals for the reduction of deforestation. As mentioned above, the Amazonas state government uses the database of the federal government for its forestry monitoring.

The weaknesses include the state REDD+ plan, the increase in deforestation in recent years, the lack of specialized personnel, strategic difficulties, the risks that the benefits do not reach the traditional populations they are destined for, the poor representation of the PIPCTs on the councils, and the mechanism of transparency.

Chart 1 – SWOT matrix of the REDD+ in the Brazilian state of Amazonas.

INTERNATIONAL	Forces • Public policies • Governance • Combat of deforestation and forest degradation • Voluntary goals for the reduction of deforestation • Monitoring	Weaknesses • State REDD+ plan • Increase in deforestation • Strategic difficulties • Risks that the benefits do not reach the traditional populations • Poor representation of the PIPCTs on the councils • Transparency mechanism
	Opportunities • Financing	Threats • A lack of continuity in financing • Changes in the constitution • Discontinuities in the government

In addition to these clear challenges, several other problems must also be confronted and resolved, including: 1. The conclusion of the Ecological-Economic Zoning of the state — only part of the state has been zoned, although even these areas still lack legal approval in the upper courts; 2. The conclusion of the regulation and operationalization of the mechanisms and programs established in the state legislation on environmental services — up to now, only one regulatory decree has been issued, which operationalizes a small proportion of the legal instruments; and 3. The need to overcome the morosity, and the technological and bureaucratic difficulties for the implementation of the Rural Environmental Registry (CAR) and Environmental Regularization Program (PRA) — according to the National Rural Environmental Registration System (SICAR) data provided by the Amazonas State Environmental Protection Institute (IPAAM) in July 2021, 96.1% of the records from Amazonas state were still awaiting analysis.

Regulatory efforts in the state — The transparency portal of the Amazonas State Environmental Protection Institute (IPAAM) provides data on the number of state court summonses issued between 2016 and 2020, which showed that a total of 1,936 summonses were issued during this period, with a mean of 645 per year, although they were restricted to only 50 of the state's 62 municipalities. The eighteen municipalities in which the largest number of summonses were issued account for 90% of the state's regulatory efforts. These municipalities include the priority areas located in the south of the state. The largest numbers of summonses were issued in the state capital, Manaus, and other municipalities of the metropolitan region, such as Manacapuru, Iranduba, Presidente Figueiredo, and Itacoatiara, in decreasing order.

It is important to note that, in previous governments (up to 2018) there was a drastic reduction in regulatory efforts. In subsequent years, however, the annual values have been recuperated, and 2020 exceeded the previous years, although these gains have been concentrated in areas that are not critical for the containment of the advance of deforestation.

In terms of external factors, opportunities may include the potential for further financing for the implementation of projects, the generation of new jobs and sources of income, as well as the promotion of improvements in the quality of life of the beneficiaries. These opportunities may nevertheless be limited by the lack of an effective national policy on the carbon credit market, as well as the restrictions on international financing, and the alternative priorities of the government, which may hamper the effective combat of deforestation.

There are also threats that the resources do not reach the individuals that protect the forest, that is, Indigenous peoples, and traditional peoples and populations (Forest Trends, 2019). In the Sudan, Abdoun (2020) identified threats such as the lack of effective mechanisms for the sharing of the benefits and the growing demand for lumber, required by several different sectors. In Tanzania, Nzunda and Mahuve (2011) also identified several threats, including poor governance, political instability, and war, as well as the loss of interest in the REDD+ from the international community.

To realize this new opportunity in the carbon credit market, it will initially be necessary for the federal government to emit a clear signal to the governments of the Amazonian states, to encourage them to seek out commercial agreements to negotiate the credits verified in its jurisdictional REDD+ programs. These credits would not entail any adjustments, which means that Brazil could claim them, not any other country, in terms of the Paris Nationally Determined Contribution (NDC). Without this signal, uncertainties will inhibit transactions and financial input (Nepstad et al., 2022).

As deforestation and forest degradation are together responsible for most of the global greenhouse gases emitted by Amazonia and, in turn, Brazil (Brasil, 2023), much of the debate on the mechanism of the Reduction of Emissions (REDD+) focuses on the effects of these alterations on the native forest cover. It is important to note, however, that natural forest ecosystems are more than mere carbon stocks, and that the implementation of this mechanism should take into consideration not only the reduction of the effects of climate change but also how the mechanism contributes to the creation of the socio-economic structures that guarantee the wellbeing of forest-dwelling peoples.

In the states that have advanced in the implementation of the mechanism, such as Acre and Mato Grosso, this preoccupation has been well considered. The Brazilian state of Acre, which covers an area larger than Portugal and Holland combined, has a 3-year contract for a total of US\$ 25 million. The state of Mato Grosso, which is larger than France and Germany together, or more than twice the size of the American state of California, has a 3-year contract for US\$ 50 million, which represents 0.05% of the state's GDP of US\$ 29 billion (Nepstad et al., 2022). However, these resources are insufficient for the effective control of the state's vast agricultural frontiers, the compensation of the actors that are effectively conserving forests, and the financing of new economic activities, such as fish farming, which requires 20 times less land to produce a given quantity of animal protein, in comparison with local cattle ranching. The true scale of the financing that could have been attained through the sale of J-REDD+ credits is more than ten times the value of the contract for Acre (US\$ 0.8 billion in eight years) and 25 times the value (US\$ 3.7 billion in eight years) in the case of Mato Grosso (Nepstad et al., 2022).

Environmental services are a key factor determining the viability of new economic models that align local development with the reduction of emissions in the state of Amazonas. The valuation of these services depends on the establishment of a system for the monitoring and disclosure of the results obtained, as well as a mechanism for the distribution of the benefits, which recognizes and remunerates the different actors that contribute to the conservation of forests and support the development of sustainable productive activities.

The REDD+ concept has enormous potential to unite the fight against climate change with the growth of low-carbon strategies in developing countries, although it cannot be the "patron saint" of forest protection. This mechanism is still difficult to define exactly, in terms

of what it both includes and overlooks. One of the most positive points of the REDD+ proposal is the possibility of uniting the efforts of different countries toward a common objective, as well as a shared preoccupation — the need to avoid and reduce deforestation and the degradation of forests, as well as the avoidance of major losses of biodiversity, thus playing a crucial role in the global climate scenario.

A proposal like this would present several challenges, which are proportional to its magnitude, which is why it would not be expected to be implemented in any rapid or straightforward way (Borges, 2011). Even so, the state already has access to strategies that can ensure a reduction of the emissions from deforestation and forest degradation, which are the state plans for the combat of deforestation and wildfires, PPCDQ-AM, which may facilitate economic-financial gains, making the REDD+ an attractive proposition. It will nevertheless be important to create a data record system to avoid the duplication of accounts and confer credibility on the carbon credits.

The data platform could ensure that essential information on these activities is registered and stored in a single database, in a transparent and easily accessed form, which is readily understood by the potential audience, in addition to guaranteeing communication with platforms that link to the markets. The centralization of access to this information may facilitate the management of the implementation of the REDD+ activities in Amazonas state, while also avoiding double-counting and providing greater transparency and credibility (Cenamo et al., 2013). The REDD+ is an important opportunity for the combat of deforestation and the promotion of economic development.

There is a clear window of opportunity for REDD+ in Brazil, which may nevertheless close rapidly, given that the developed countries may be able to gradually establish their strategies for the reduction of emissions through the development of alternative technologies. This may mean that there will be a point at which investment in forests is not as attractive as that in recent technologies for the mitigation of impacts (Borges, 2011). Even so, it is hoped that the reduction in emissions from the forestry sector will bring a series of other benefits for sustainable development. It is important to note, however, that the reduction of emissions may limit the development of the forestry or farming sectors, which may require co-financing from the country with the forest reserves.

Conclusions

Since 2007, the Brazilian state of Amazonas has established legal mechanisms that support policies for the control of illegal deforestation, paving the way for the implementation of a jurisdictional REDD+. The state became eligible in 2021 to receive payments for the reduction of emissions from deforestation, amounting to a total of 809,670,198.54 tCO₂e in credits. State Decree no. 46,596 (Amazonas, 2022), which was published in 2022, defined the credits "allocated via CONAREDD+", which refer to areas of native forest, including conservation units and Indigenous lands, as an economic weapon for the combat of greenhouse gas emissions.

The analysis of the SWOT matrix revealed several challenges and opportunities for the implementation of the REDD+. Internally, the forces include public policy, the combat of deforestation, governance, monitoring, and the goals for the reduction of deforestation. The weaknesses are the lack of a statewide REDD+ plan, increasing deforestation, the lack of specialist personnel, strategic difficulties, risks for traditional populations, and limited transparency.

Externally, the opportunities include more financing and jobs, and improvements in the quality of life. Even so, the limited scope of the results is threatened by the lack of federal legislation on the carbon market, restrictions on international financing, and diverging priorities.

Overall, it can be concluded that the J-REDD+ is a vital strategy for the financing of local initiatives against climate change, considering both current and future needs. The implementation of the

safeguards of the REDD+ projects will also be crucial, especially to guarantee the participation of traditional peoples and their fair share of the benefits, which will be fundamental for the success of the state-level REDD+ strategy with an effective and transparent MRV system.

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