sustainability

MDPI

Review

Uncovering REDD Plus in Brazil

Karla Sessin-Dilascio [1], Charles Borges-Rossi [2] and Paulo Sinisgalli [1,*]

[1] Instituto de Energia e Ambiente, University of Sao Paulo, Sao Paulo 05508-900, Brazil; karla.dilascio@usp.br
[2] Campus Floresta, Federal University of Acre, Cruzeiro do Sul 69980-000, Brazil; charles.rossi@ufac.br
* Correspondence: psinisgalli@usp.br

Abstract: This article delves into the evolution of Brazil's REDD+ architecture. We explore how, despite initial challenges like the lack of a global consensus and the complexities of multi-level negotiations, Brazil has transformed REDD+ into a "boundary object"—a concept that bridges diverse institutions. Consequently, a rich tapestry of institutional arrangements has emerged for Brazilian REDD+ projects. The study, drawing on interviews, literature reviews, and action research, sheds light on a critical aspect: the reliance on auditing firms for project reports. This dependence, the research finds, can introduce inconsistencies, making it difficult to accurately assess project compliance with established standards. By tracing REDD+ from its international negotiation roots to its current operationalization in Brazil, this article aims to illuminate key insights into the mechanism itself.

Keywords: REDD+; institutions; Brazil

check for updates

Citation: Sessin-Dilascio, K.; Borges-Rossi, C.; Sinisgalli, P. Uncovering REDD Plus in Brazil. *Sustainability* **2024**, *16*, 5409. https://doi.org/10.3390/su16135409

Academic Editors: Baojie He, Siliang Yang, K. Venkatachalam, Amos Darko and Ali Cheshmehzangi

Received: 29 March 2024
Revised: 22 May 2024
Accepted: 6 June 2024
Published: 26 June 2024

1. Introduction

Today, REDD+ mechanisms are widespread around the world as an important payment for ecosystem services (PES) strategy, although the concept and understanding of its operationalization remain uncertain. Created within the framework of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC), REDD+ (Reducing Emissions from Deforestation and Forest Degradation plus the sustainable management of forests and the conservation and enhancement of forest carbon stocks in developing countries) is a voluntary mechanism applied to reducing human pressure on forests that places economic value on avoided deforestation practices that keep the forest standing [1–3]. It was designed as a mechanism in which developed countries financially support developing countries in reducing greenhouse gas (GHG) emissions linked to forestry [4]. However, the manners in which these objectives can be reach varies among projects around the world [1–7]. The variations cover the ecosystem service (ES) and measurement methodology, the activities and areas that should be considered in the framework of the mechanism, the levels of project governance, the arrangements for monitoring results, the financing models, and the forms of participation and involvement of local communities [3]. This ambiguity and plasticity in terms of structure and conceptualization places REDD+ as a "boundary object" that finds its meaning in the particular context. A boundary object is a concept with a shared core meaning that can adapt to different contexts [8]. All these variations in the constituent elements of REDD+, which make the concept thicker in practice, can make it difficult to assess the mechanism in terms of its central objective of reducing emissions from deforestation and forest degradation [8]. Considering the importance of power not just in defining rules, but delineating their implementation process, and understanding that PSE processes are often characterized by power asymmetry that perpetuates the persistence of inequities, this article aims to discuss the possible frameworks of institutional arrangements [9–11] of REDD+ projects in Brazil, highlighting their different typologies. Guided by the question, "What are the different institutional arrangements related to REDD+ projects in Brazil?", the article seeks to contribute to a better understanding of the possible typologies that make up

REDD+ projects and programs in Brazil, with an emphasis on Brazilian experiences. Based on the multi-method approach [12], which begins with a systematic review and scoping review [13], expanded with information from action research [14] and the analysis of 29 unstructured interviews with social actors relevant to the REDD+ context in Brazil and Latin America carried out between January and December 2022. The article builds on the discussions on the creation of operational typologies for REDD+ projects [7,8] deepening the identification of institutional arrangements brought about by the systematic review and creating new typologies that help to understand the trade-offs associated with REDD+ projects in Brazil. More than just applying a normative framework for REDD+, the article aims to investigate the basis of the conceptual and institutional structure for REDD+ in Brazil and adds to the efforts of other studies to understand and contribute to the reflection on the possibilities for operationalizing REDD+ [7,8]. It engages in analytical reflection about the differences and constraints of the two main institutional arrangements (e.g., jurisdictional REDD+ programs and voluntary REDD+ projects) regarding due diligence mechanisms for procedural justice.

1.1. The History of International REDD+ Negotiations

The first multilateral meetings on climate and environmental issues were already looking for mechanisms that could help solve the climate crisis. The Kyoto Protocol (KP), created at COP3 (1997-Kyoto), established the first binding international agreement on climate change, along with rules for the mitigation and compensation of GHGs by Annex I countries (developed countries). The KP was innovative by creating the carbon credit market, in which Annex I countries could offset the emissions they lacked to meet their reduction targets by purchasing credits from Annex II countries (developing countries), through the Clean Development Mechanism (CDM), in its Article 12 [5]. The KP and CDM were a breakthrough in the climate agenda and in defining institutional arrangements for reducing GHGs. Many of these arrangements have served as the basis for, or have been incorporated into, the definition of new reduction mechanisms [5]. The KP and the CDM have established institutional arrangements that underpin voluntary carbon markets, the main ones being: (1) the definition of a GHG reduction target (Carbon Emissions Reduction Target—CERT); (2) the quantification of emissions and the issuance of tradable carbon equivalent certificates (Certified Emission Reduction—CER); (3) the creation of standards that follow rigorous scientific methodology, recognized by peers, as a necessary condition for issuing tradable CER; (4) third-party mechanisms for monitoring, verification, and reporting (MRV) as a necessary condition for CER. All these new economic and institutional technologies have been recognized by the IPCC and UNFCC, and by the most important climate researchers and experts. KP was responsible for the institutional change needed to establish a new market in which ecosystems become economic assets to be internalized in economic transactions and the GDP of countries [15]. With Kyoto's extreme focus on carbon-generated biases and some anomalies, the REDD+ discussions launched the possibility of covering other emitting activities and valuing different ES, including services generated by tropical forests to overcome climate change with elements of social justice for tropical countries and forest communities [16]. In 2003, Brazil led the creation of the Coalition for Rainforest Nations (CfRN) and presented the first proposal for Compensated Emission Reductions (COP 9-Milan), starting negotiations to include tropical forests in the international GHG compensation and mitigation agenda. In 2005, the acronym RED (Reducing Emissions on Deforestation) appeared at COP 11 (2005-Montreal) as an alternative and complementary mechanism to the KP. In 2007 (COP13-Bali), RED became REDD (Reducing Emissions on Deforestation and Degradation), the Bali Action Plan was created, and the conditions for countries to start their national REDD readiness programs were defined. In 2009 (COP15-Copenhagen), REDD+ incorporated sustainable forest management activities and consolidated its acronym, after intense negotiations and pressure from the BRICs (Brazil, China, and India), who wanted to establish an international agreement that prioritized their forests, replacing the KP, which was approaching expiry [2,3].

Figure 1 shows the timeline of the COPs' discussions, indicating relevant milestones to the REDD+ discussions.

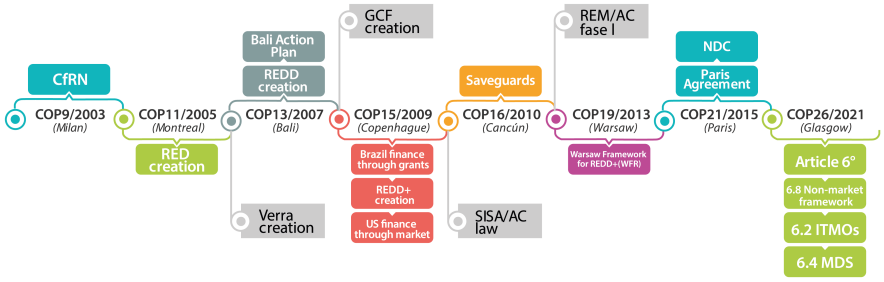

Figure 1. Timeline of the COPs' discussions and milestones for REDD+ discussion.

Bali (COP13) began the process of structuring and identifying the constitutive objectives of REDD+ from the multilateral discussions parallel to the COPs. These discussions culminated in the addition of new activities ("plus") that promote the conservation and enhancement of forest carbon stocks (e.g., forest management, extraction of non-timber products, etc.) [4]. As for financing mechanisms, the positions of the United States and Brazil differed—the former focused on market-based mechanisms, while the latter on funds and donations from developed countries to developing countries, as a compensatory policy. The social aspects and other non-carbon benefits (e.g., biodiversity) of REDD+ projects highlighted issues of land tenure [17], compliance with the prerogatives related to Free, Prior and Informed Consultation (FPIC), dysfunctions in forest governance in the countries, and corruption issues [4,5,18]. Concerns about the trade-offs of REDD+ have grown in proportion to the number of new projects and programs that have emerged post-COP13. Added to these discussions are the ideal financing model for REDD+ and the related poverty alleviation objectives [2]. The Cancun Safeguards, created in 2010 (COP16-Mexico), established a list of principles that should guide the implementation of REDD+ projects as a possible prerogative to mitigate the trade-offs regarding equity and benefit-sharing identified in the mechanism. Many expectations were placed on COP15 (2009) for the definition of new GHG emission reduction targets that would keep the global temperature increase below two degrees Celsius from 2013 to 2020. However, none of these expectations were met. COP15 ended with the signing of the "Copenhagen Accord", which is not binding on the UN system. The reasons for this failure and the freezing of REDD+ negotiations on the global agenda are controversial. Post-COP15, REDD+ has experienced obstacles both in the creation of a binding global climate agreement and in the operational deepening of the institutional arrangements linked to REDD+, as well as the acceptance of this mechanism within the UNFCCC [4]. Unlike the KP, whose national targets were linked to a regulated CDM market, and well-established compliance and MRV mechanisms, underlying the processes of accounting for emission reductions, the interruption in the multilateral REDD+ discussions redirected the credits produced by the mechanism toward the voluntary market and decentralization [15]. The gap in discussions about the global architecture of REDD+ has affected the design of the institutional arrangements that should enable its application [1]. The post-COP15 scenario shifted national REDD+ strategies towards sub-national REDD+ strategies that dialogues with the mechanisms defined in the Bali Plan. Social actors migrated from national agents to state and district leaders. The Governors' Climate and Forest Task Force (GCF), created in 2008, marks this migration of REDD+ governance. [19]. The migration of discussions on institutional arrangements for the climate from the UNFCCC to sub-national governments has opened a new avenue for multilateral agreements. The decentralization and voluntarism of countries regarding their ambitions for the climate agenda was the hallmark of the Nationally Determined Contribution (NDC) and Article 6 in the Paris Agreement (COP21-2015) [5,20]. The same trail follows the definition of the REDD+ architecture by the UNFCCC and the basic institutional design for the operationalization of the mechanism. These uncertainties have made

REDD+ ambiguous and plastic, available to solve a wide range of challenges related to forest governance [8]. REDD+ becomes, following McDermott et al. [8], a 'boundary object', discussed in more detail in the next section. The signing of the Paris Agreement and the discussion of Article 6 pointed to the creation of a new regulated carbon market, which still needs to overcome political difficulties and technical bottlenecks [5,20].

2. Theoretical Background

The REDD+ mechanism seeks to generate changes in land use and occupation in tropical forest areas, to reduce deforestation and forest degradation, and encourage sustainable uses of the forest. The change expected in the application of the mechanism involves the relationship established between humans and nature, whether through cultural, spiritual, production, or regulatory relations. Considering that human relations and interactions are mediated by institutions, the changes sought by the REDD+ mechanism move towards institutional changes. The limited understanding of institutions in the payment for ecosystem services (PES) literature could be a significant factor in developing more robust intervention policies, and it remains a "blind spot" in discussions on political ecology [21]. According to Douglass North, institutions are "rules of the game in a society or, more formally, the humanly devised constraints that shape human interaction" [9] providing formal and informal rules that regulate human interactions. Geoffrey Hodgson, in his important article "What are Institutions?", discusses the various concepts and ramifications of institutional theory, and deepens North's [22] definition by establishing that "institutions are durable systems of established and embedded social rules that structure social interactions, rather than rules as such. Institutions are social rule systems, not simply rules" (p. 13) [22]. Hodgson [22] stresses the importance of the interdependence between systems of social rules, in which formal institutions depend on informal institutions, emphasizing that institutionality created by external agents is only effective when it is incorporated into the concrete realities of local agents. Although there is no consensus among theorists on which analytical elements constitute institutions, concepts such as norms, laws, and formal and informal rules are common to institutional theory. For this paper, the definition of formal and informal rules is used according to Hodgson [11,22], with formal rules being those that can be codified and sanctioned by some authority or set of identified social actors, and informal rules being those that are normatively imposed by a social grouping based on collective intentions, being customary and tacit, and therefore, often difficult to codify and understand. Mahoney and Thelen [23] highlight the importance of power not just to define a law, but in establishing the way in which laws are translated into rules. Considering that PSE processes are often characterized by power asymmetry that perpetuates the persistence of inequities, understanding the historical context, social actors involved, and governance processes in place is key to understanding what has influenced and shaped REDD+ institutional architecture and how its environmental goods are being distributed throughout communities [24]. Using Mahoney and Thelen's [23] theory on patterns of institutional change and environmental justice components [24], this article mobilize a multi-method approach to identify the different institutional arrangements related to REDD+ projects in Brazil, the procedural justice related to institution definition and changes (e.g., power, representation, deliberation, and governance) [25], and its results regarding distributive justice in those different REDD+ arrangements. Mahoney and Thelen [23] explain that, in most cases, institutional change is incremental and related to four types of patterns: (1) Displacement; (2) Layering; (3) Drift; (4) Conversion. In displacement, a new rule replaces the old one. Layering introduces a new rule that acts in parallel to the existing rule. In drift, there is a change in the political environment that generates a change in the impact of an existing rule. In conversion, the rule remains the same but is interpreted differently. According to the authors, in environments of extreme competition, where the veto power of political actors is high, drift and conversion patterns of institutional change tend to prevail [23]. The permanence of a rule depends not only on the continuity of its application, or on the maintenance of the rule in a country's legal framework, or in

international agreements, but on the way it is substantiated in practice, on the interaction between the external and internal context, and on how the rule is interpreted by the social actors to whom it falls. Incremental institutional changes can arise from new interpretations of the rule since written laws and agreements have flaws, blind spots, and gaps subject to interpretation [23]. In addition, the influence of different institutional logics which influence the results of REDD+ programs and projects must be considered [26]. The process of creating international REDD+ agreements is a good example of these different patterns of institutional change. REDD+ emerged in parallel to the Kyoto Agreement (layering), as explained in Section 1.1, as a possible alternative substitution mechanism (displacement), based on multilateral negotiations that took place within the framework of the UNFCCC. On the other hand, the change in the political environment has led to a change in the impact of the mechanism (drift), which has come to be interpreted differently (conversion) among the different social actors and organizations responsible for the practical implementation of REDD+ in the territories. In this sense, this article aims to understand the formal institutions derived from binding international agreements on the application of REDD+ under the UNFCCC and their impact on the mechanism's institutional architecture and design in Brazil. The article demonstrates how these uncertainties have made REDD+ ambiguous and plastic, as defined by Mcdermott et al. [8] as a boundary object, a new apparatus available to solve a wide range of challenges related to forest governance. The article points to the importance of NGOs in the Amazon, which act as institutional entrepreneurs [27] to generate innovation and institutional change in the application of the mechanism in different contexts. In the examples studied, NGOs acted as thinktanks and invested human and financial resources to create institutional arrangements for REDD+ projects, including voluntary projects.

3. Materials and Methods

The study used a mixed-methods approach to collect data [12], including open-ended interviews by snowball sampling, literature review [13], and action research [14]. The first step in data collection involved conducting open-ended interviews, both online and in person, with stakeholders involved in the REDD+ agenda in the country, during the period between 14 March 2022 and 3 April 2023. Open interviews were chosen as a mechanism for in-depth exploration of the participants' perceptions, experiences and views on institutional arrangements for REDD+ projects in Brazil in the face of a variety and diversity of possible arrangements (e.g., funding sources, institutional arrangements, ecosystem services of interest, among others). Instead of directing the interviewee towards semi-structured or structured responses, the researchers were interested in understanding divergent views, deepening contradictions and co-constructing, in parallel with the current scientific literature on the subject, the first image of institutional arrangements for REDD+ projects. The researchers defined an initial interest group for the research, which started with managers linked to jurisdictional REDD+ projects in the states of Acre and Mato Grosso. These managers then indicated other people of interest to be interviewed, using the snowball technique [12]. A total of 29 stakeholders were interviewed. The snowball technique presented a bias that limited the interviews to governmental institutional arrangements and related actors, with a low representation of indigenous institutions, and without reaching private organizations, which were the object of interest of this research. Through this technique, the following were interviewed: managers of Brazilian NGOs (7), government managers (10), social movements (9), indigenous organizations (3). To reduce the bias regarding institutional arrangements, the research focused on analysis of the literature review, explained in more detail in the following subsection. The review provided important information, especially on institutional arrangements arising from international agreements and discussions. The articles also provided us with a theoretical overview of the discussions in the literature on the topic, especially with regard to the points of analysis of the effectiveness of REDD+ projects, the conflicts related to local communities, and the possible models of valuation of ecosystem services that would fit into REDD+.

These two methods of data collection and analysis were still unable to reach the recent institutional arrangements that dealt with web 3.0 technology. Little was mentioned about voluntary REDD+ project arrangements. It was necessary to incorporate field data and action research [14] data acquired by the researchers in the context of their work with voluntary REDD+ projects. The researcher's connection to networks that connect carbon investors in the Amazon (e.g., Amazon Investor Coalition, ReFi DAO, OFP, EarthShot Labs, Forest Base, Moss) was essential for the research on new institutional arrangements for voluntary REDD+ projects, opening up a new network of connections that was not available. Even with the opening of this new node of relations with Amazon investors, it was not possible to apply the snowball technique; many of the companies did not know or were not interested in presenting other carbon investment companies. There were even restrictions on access to the websites of certain companies. This scenario of instability and high competitiveness brought limitations on the scope of interviews that could be carried out with companies involved in REDD+ projects. The variety of arrangements and companies, in a market not yet as consolidated as that of web 3.0 methodologies for carbon projects, directed this thesis to the analysis only of projects certified by Verra, as a consolidated platform, which follows principles of transparency and accountability for its projects, from the creation of a fungible currency (carbon credits, based on equivalent avoided carbon) based on emissions reductions and removals related to the forest.

Systematic Review Methodology

The systematic review methodology was structured around the systematic review protocol drawn up by the authors of this article (Table 1). The protocol systematized the research context data and established research questions and indicators following the PiCo framework (Population/Problem, Interest, Context) [13,28]. The review was carried out in relation to the research question: What are the institutional arrangements for REDD+ projects? Table 1 summarizes the authors' choices regarding the selection and filtering of literature. CADIMA software, version 2.2.4.2 [28] was used to organize the metadata and PDFs of the articles selected in the searches of the Web of Science (WoS) journal databases.

Table 1. Table of the systematic review protocol, indicating the PiCo framework and the inclusion and exclusion variables for the selection of articles.

PICo	Inclusion Criteria	Exclusion Criteria
POPULATION: Recognition of the institutional arrangements that operationalize forest REDD+	REDD+/REDD/REDD plus REDD+ program REDD+ project Forest governance Forest policy Climate governance	REDD related to fish ecology, REDD+ related to carbon measurement (aboveground/ above-ground biomass), Bio-diversity abundance related to REDD+ (abundance and composition of mammals, etc), Blue Carbon (watersheds) CDM and Kyoto mechanism, Biodiversity benefits, REDD+ not PSE in general Books
INTEREST: What are the different institutional arrangements related to REDD+ projects in Brazil?	Institution arrangements, Safeguard, Participation. Indigenous people ILO	Remote sense, MRV, Agroforestry (food)
CONTEXT: Brazil, Latin America, Tropical Forests	Amazon, Latin America, South America Brazil, Review	Africa

Prepared by the authors.

Keywords in English (REDD+, REDD+ AND concept, REDD+ AND institution, REDD+ AND history) and the "Brazil" filter were used to search for articles in WoS. A total of 393 articles were uploaded to the CADIMA platform as .RIS files. Of these, 17 were selected for the scoping analysis. These articles were supplemented with gray literature

publications from thinktanks that play an important role in the conceptual construction of REDD+ in Latin America (e.g., CIFOR, IPAM, Forest Trends, ICV, The Ea articles of interest). A total of 50 documents were analyzed, including articles, books, and book chapters, subjected to scoping and coding in Nvivo, as well as critical analysis of the documents and files found [13]. The articles were coded in Nvivo in two stages: exploratory coding and systematic coding. In exploratory coding, all the articles were divided into broad categories. The doc coding of the articles resulted in 11 codes. In the second stage, the codes themselves were analyzed to identify the key information for the six groupings mentioned in the previous section: (1) levels of governance, (2) ownership of the SE, (3) type of SE evaluated, (4) financial models, (5) methodologies for measuring results, (6) safeguards and benefit sharing. These analyses were augmented by the transcription and coding of 30 unstructured interviews conducted online and in person between January and December 2022, and by action research [28] of the Amazon Regenerative Frontiers Research Group (Instituto Fronteiras/UFAC-Floresta) during the process of developing REDD+ actions in the context of the Upper Juruá basin.

4. Results

REDD+ Typologies

The institutional typologies of REDD+ projects in Brazil have varied greatly since their inception. Although most of the articles analyzed focus on the analysis of one or other REDD+ typological conditions, this session tries to reconstruct, based on categories and typologies that organize the institutional arrangements that constitute the architecture and design of REDD+ projects [1,2], the typology of institutional arrangements for REDD+ projects in Brazil, combining elements from the systematic review, action research, and interviews. The challenge of this effort was to organize the institutional arrangements built up over the history of the mechanism, as well as recent innovations in the field of PES and nature-based solutions. Another challenge, of a conceptual nature, was to fit the different recent types of PES into the REDD+ framework. The article focuses on describing the acronym and its ultimate goal of reducing deforestation and forest degradation as a heuristic way of framing the typologies of institutional arrangements that have not yet been systematically described in the literature, especially the new Web 3.0 market models. Figure 2 seeks to compose the typologies associated with REDD+ in Brazil. Some elements of the figure were derived from the analysis of the articles selected by the systematic review, others from action research and interviews on the REDD+ mechanism, with a focus on Brazil.

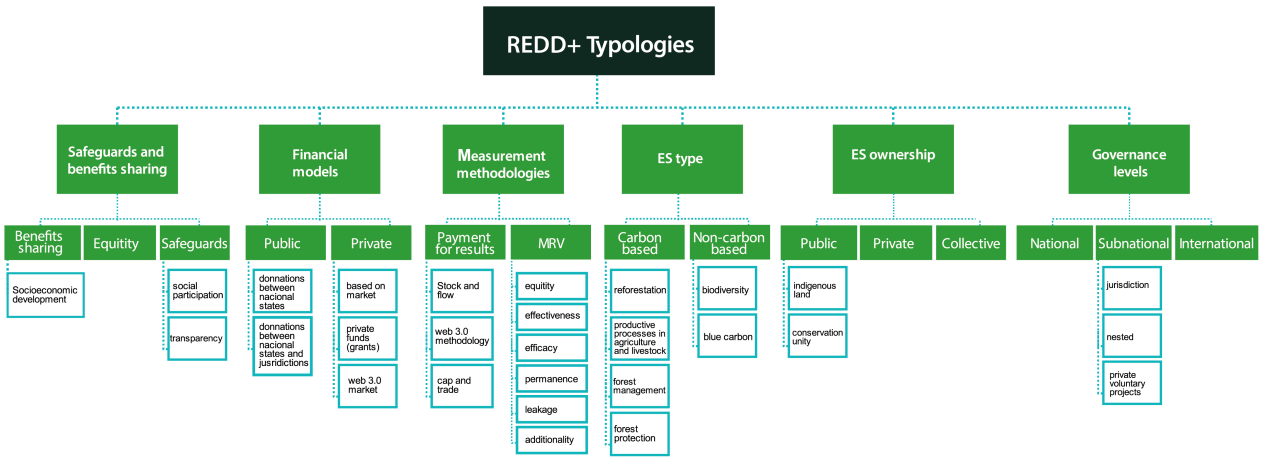

Figure 2. REDD+ typologies in Brazil (Source: prepared by the authors).

In terms of levels of governance, REDD+ projects can be national, international, or sub-national, the latter of which the literature considers includes private and local projects. Some authors also call national and sub-national projects "jurisdictional" [15,19,29]. In Brazil, this term is used especially for projects run by state governments, although use of this name is not yet a consensus in the literature analyzed. Jurisdictional projects can go beyond the jurisdiction of the state, linking another geographical category, such as the basin, although this has not yet happened in Brazil. The "nested" category represents projects that integrate jurisdictional and project strategies, with different perspectives, and with many doubts about how it can be operationalized. Verra, a certifier of REDD+ projects for voluntary markets, has created a specific certification called the "VCS Jurisdictional and Nested REDD+ Framework", which aims to integrate "project-level REDD+ activities" with a "government-led program", created based on consensus on the reference levels of emissions and shared methodology, using the Verra system of registration and independent auditing. In the literature, the financing mechanism for this governance category is often confused. Although "government-led programs" mainly receive grants from bilateral or multilateral arrangements, it does not impede projects in state areas (e.g., protected areas) to receive private funding, even if this is not yet common practice in REDD+ projects. In Brazil, multilateral investments and funds (e.g., Global Environmental Facility—GEF, Green Climate Fund—GCF) are normally the finance model for jurisdictional projects, such as the REDD+ for Early Movers (REM)'s program provided by the Acre and Mato Grosso state governments that was initially financed by German bank BMZ and operated in partnership with NGOs (e.g., ICV, PCI, CPI- Acre, IPAM, WWF, CI, FUNBIO), cooperation companies (e.g., especially GIZ—Deutsche Gesellschaft für Internationale Zusammenarbeit), and government agencies (e.g., FUNAI, SEMAs). Safeguards and benefit sharing interact with aspects of governance. Problems exist related to inefficiency in FPIC processes, lack of transparency or vagueness about benefit-sharing policy, legal insecurity for communities regarding their permanence in the territory as a driver of food insecurity, intensification of internal community conflicts, co-optation of community leaders by local elites, and permanence of colonial power structures, among others [30–32]. The local negative impacts generated by the implementation of REDD+ projects refer to the mitigation principles set out in the Cancun Safeguards, and to mechanisms identified in local contexts as follows: compliance with national laws; respect for the knowledge of indigenous peoples and traditional communities; compliance with international and national declarations; "full and effective" stakeholder participation; the involvement of local communities in decision-making, the need for benefit-sharing, and the possibility of establishing clear and reliable local arrangements between entrepreneurs and communities as a requirement for the permanence of REDD+ results [8,32]. These programs have managed to generate important institutional changes to the inclusion of indigenous peoples [11], from the design of the program to the creation of instances of social participation for multi-stakeholder decision-making, such as CEVA (State Commission for Validation and Monitoring of SISA) and the Indigenous and Women's Thematic Chambers of REM-AC, in addition to extensive FPIC processes, which included support for the structuring of indigenous representative associations, such as FEPOIMT (Federation of Indigenous Peoples of Mato Grosso) in REM-MT, and the creation of indigenous affairs secretariats linked to the organizational structure of the state government. These programs have managed to overcome some aspects of the path-dependence of the institutions in place, creating a process of institutional change at the sub-national level [11]. In addition to the changes in state legislation to include payment for environmental services programs (Law No. 2.308/2010 SISA/AC and Law No. 5.235/2018 PESA/MT), there has been the creation of social participation spaces for collective decision-making, where local social actors, state agents, financiers, and NGOs meet, in an attempt to overcome the trade-offs of the multi-level governance characteristic of REDD+. In addition, the inclusion of local actors right from the design of the project seems to have generated relevant results for the legitimacy of the program, as well as democratic gains in the socio-environmental agenda of the states mentioned,

according to the reports of the interviewees. The inclusion of indigenous peoples in the decision-making process of these programs was an undeniable innovation. For the first time in Acre's history, a secretariat for indigenous affairs was created, and in MT, a superintendence for indigenous affairs (State Decree No. 480/2020). Recently, a new public-private arrangement for financing jurisdictional programs based on public areas that mobilize private investment has emerged, the so-called LEAF (Lowering Emissions by Accelerating Forest Finance) Coalition. The LEAF Coalition presented the ART/TREES standard in Glasgow (COP26), aiming to certify avoided carbon emissions from jurisdictions that have signed the LEAF agreements, so that their carbon equivalent verified emissions (e.g., TREES—The REDD+ Environmental Excellence Standard) can be sold to private entities to meet their voluntary targets based on their ESG (Environment, Social, and Governance) agendas. The states of Amapá, Amazonas, Mato Grosso and Pará have already signed the letter of intent to join the LEAF Coalition and to use the ART Registry (Architecture for REDD+ Transactions Registry). However, the issue of both private projects and private financing of public projects and areas are still a stumbling block in discussions on REDD+. Who owns the ecosystem service (SE) in place is the subject of a relevant discussion on governance and measurement methodologies [29,33,34]. Issues related to land tenure were among the most discussed in the articles found in the systematic review. The mainstream argument is that land ownership drives ecosystem service property rights and, therefore, defines who benefits financially from the SE. However, the argument does not stand in cases where ownership of the resource is not clear or even when it is in dispute. Examples include private projects in Indigenous Lands or Conservation Units [34,35] or any another collective areas in use that do not have a clear land tenure definition (e.g., Acre's rubber tappers territories, open access areas, such as non-designated government areas, etc). In Brazil, land tenure issues are responsible for violent conflicts all over the Amazon region [21]. The complexity of land tenure policy and occupation in Brazil dates back to colonial times, with military dictatorship, and entails great complexity in environmental governance approaches [30,36]. The discussion is beyond the scope of this article, but we suggest referring to [21] for more details on this matter. The methodologies for measuring REDD+ results are divided into cap-and-trade, programmatic stock flow, and web 3.0 methodologies [15,19,29,37,38]. The first is linked to REDD+ projects aimed at voluntary or regulated markets, the second to mechanisms for measuring results at the state level, and the third to new mechanisms using artificial intelligence, metaverse, NFTs, cryptoassets, apps, crowdsource, and other technological contributions. In summary, the cap-and-trade methodology uses a reference target area as control to measure the deforestation rate over time in a business-as-usual scenario. A REDD+ project has to prove it has avoided planned or unplanned deforestation and forest degradation depending on the carbon reduction methodology adopted by the project. In Brazil, the voluntary carbon market is mainly settled according to the Verra standard, which adopted cap-and-trade as the main carbon measurement methodology. This research found that almost ninety percent of all private carbon projects in Brazil use Verra standard bases. Verra is a non-profit private organization from California that creates carbon standards that can be used to take part in the California and European Union regulated carbon market. In Brazil, the VM0007 and VM0015 Verified Carbon Standard (VCS) methodologies are the most used in REDD+ projects' certification process (AFOLU—Agriculture, Forestry and Other Land Use). Although, these regulated markets prohibit the use of Verified Emission Reduction Ton (VERT) from AFOLU projects [15], what has significantly impacted the carbon equivalent price of these projects is that private enterprises in Brazil manage to sell their VERT in voluntary markets.

The programmatic stock-flow methodology was developed in 2011 by IPAM (Instituto de Pesquisa Ambiental da Amazônia) researchers [19,29]. The proposal was initially created for the Carbon Environmental Services Incentive Program program (ISA Carbono) in Acre and has been adopted by other jurisdictional programs related to the REM arrangement. This methodology measures both the past impact (stock) of avoided deforestation and forest degradation, along with the current rate (flow) of deforestation within a specific

jurisdiction. By comparing these metrics to the national deforestation baseline over a defined period, it facilitates the development of a feasible results-based payment scheme for jurisdictional REDD+ projects. Web 3.0 methodologies and blockchain technology are more difficult to identify, analyze, and even classify as REDD+. Some examples of crowdsource methodology for reforestation projects (Open Forest Protocol) or standing forest maintenance (AtomicFund, ForestBase), with financing in crypto-assets, especially Ethereum, and NFTs, as well as strategies for using metaverse technology, are populating the climate market. The World Bank sees in this new technological frontier a great opportunity to reduce the trade-offs related to multi-level governance related to the mechanisms that make up the climate agenda [37,38]. These methodologies adopt unique approaches to financing forest conservation. AtomicFund, for instance, utilizes a projected replica of the real forest within the metaverse to attract funding for protecting the actual forest. The Open Forest Protocol, on the other hand, provides direct financial support for reforestation projects. Their app serves as a tool for measuring the effectiveness of these replanting efforts. Another example is ReFi DAO (Regenerative Finance Decentralized Autonomous Organization), a community-oriented organization that uses decentralized finance (DeFi) to finance regenerative projects, involving around 75 organizations, with diverse investment interests (harvesting, seeding, nurturing, growing) in the carbon market, distributed across all continents. The diversity of arrangements, business models, institutionalities, countries and interests, highlights the size of the proportion that the carbon market can take, especially from the perspective of web 3.0 methodologies. Financial models for REDD+ show significant convergence with governance levels and outcome measurement methodologies. In this context, the terms "public" and "private" are defined based on the funding organization rather than the recipient of the funds. In many cases, the analyzed papers connect projects in designated public areas (e.g., Indigenous Lands) to financial models involving multilateral funds or state-led financing, although this is not always the case (e.g., Suruí Carbon Project). Private financing models include private donation funds, revenues from the sale of SE, and funds derived from the web 3.0 market. Private projects are not well represented in the systematic review papers, so gray literature, standards reports (e.g., Verra, Gold Standard), and action research were crucial for understanding the system behind private projects. The nomenclature surrounding these projects is also somewhat controversial. In Brazil, these projects are referred to as REDD+ offset, in reference to REDD+ cap-and-trade projects, or voluntary REDD+, but typically refer to private projects that are not state-driven. Finally, issues related to safeguards and benefit sharing, although included in one category, are cross-cutting aspects for REDD+ projects and programs, and concern aspects of equity related to transparency, social sharing, and decision-making, sharing benefits both between countries and between entrepreneurs, governments, and communities [6] and will be further discussed in the next section.

5. Discussion

The current uncertainty about what a REDD+ mechanism actually means, in terms of safeguard and benefits sharing, measurement methodologies, ecosystem services type, ecosystem services ownership, governance level, financial models, and governance levels, has to do with how the REDD+ institutional arrangement process took place over time. With the final date of the Kyoto Protocol as the horizon, in an environment of high competitiveness to establish a new climate agreement backed by the UNFCC, countries in the global south, holders of tropical forests, sought to create REDD+ as an alternative arrangement that could provide financial resources to protect its forests. However, considering that "UNFCCC only nation-state are the only delegates with voting power" [25], in situations of high competitiveness where the veto power of political actors is high, patterns of drift and conversion of institutional change tend to prevail. Although the global south sought a REDD+ architecture as a "layering" process over the Kyoto Protocol, created by the Coalition for Rainforest Nations (CfRN) as a parallel mechanism to the existing Clean Development Mechanism (CDM), REDD+ has not been accepted as a binding mechanism under the

UNFCCC climate change mitigation umbrella at COP15 as expected. The failure of the "Copenhagen Accord" and the lack of a binding global climate agreement has deepened the controversial institutional arrangements for REDD+, reflected not just internationally but at national levels as well. A change in the international political environment (e.g., REDD+ withdrawn in "Copenhagen Accord") generated an adjustment (drift) and conversion in the REDD+ rule. This generated ambiguities in the understanding of the rule ("gaps"), in the sense of possible institutional arrangements for REDD+, which opened a space for interpretation regarding its application, stimulating incremental institutional change towards drifting and conversion processes, as explained by Mahoney and Thelen [23]. The drift process was reflected in the diversity of governance arrangements created for the REDD+ mechanism in a multilateral context that surpassed UNFCCC binding climate agreements. Without a clear direction from UNFCCC, national states and local jurisdictions launched their own concepts regarding REDD+ institutionalization, creating bilateral agreements to encounter climate goals using jurisdictional REDD+ programs even without UN presence and support. The REM-Acre and REM-Mato Grosso are programs born as a result of the UN binding climate change agreement drifting process. In the same move, the voluntary REDD+ market appeared as a different rule interpretation, converting an initial state-focused arrangement into a market-driven mechanism, that recalls some aspects of the initial REDD+ idea, but includes diverse possibilities in terms of ecosystem evaluation, methodology, finance arrangement, and so on. The emergence of web 3.0, crowdsourcing and cryptoactive technologies, has presented new possibilities for reinterpretation and conversion of REDD+ institutional arrangements. However, the absence of a binding international mechanism has changed the scope of REDD+, broadening the possibilities for its application and acceptance as a "boundary object". REDD+ continues to grow, albeit slowly, in the absence of international agreements and despite the instability of national programs. The expansion of REDD+ to decision-making levels that were previously peripheral to the climate agenda (e.g., sub-national and local) may have brought about important changes, not only in the architecture of the mechanism but also in the revision of the design of climate governance, as shown in Figure 3.

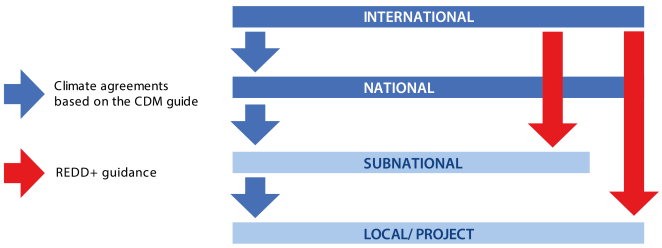

Figure 3. Difference between the scales of action of climate agreements in the environment without REDD+ (blue) and with REDD+ (red) (Source: Prepared by the authors).

Despite international agreements, REDD+ has created room for sub-national and international organization cooperation (e.g., REM) as well as local and international ones (e.g., voluntary REDD+). In certain ways, REDD+ in a place of "boundary object" opens possibilities to diminish the distance between other decision spheres, shortening the decision-making process and reducing the influence of top-down decisions in defining institutional arrangements compared to CDM. The new institutional arrangements emerging from REDD+ have improved multi-level synergies by linking community (bottom-up) and state government (top-down) institutional arrangements in the search for positive results to maintain the forest. Jurisdictional REDD+ programs in Brazil are heavily influenced by international government founders who emphasize procedural justice [24] in terms of democratic governance instruments as a precondition for continued support. "Due diligence" processes are fostered by governments, ensuring transparency, participation, and equitable benefit sharing. These programs encourage the inclusion of NGOs, social movements, and frontline communities (e.g., indigenous people, traditional communities, minorities,

and poor communities) [25] in the political arena, aiming to create a more transparent and accountable system. This can be interpreted as an attempt to mitigate power imbalances in land-use decisions, particularly regarding the rural elite lobbying for land conversion from forest to cattle ranch or soy bean production, especially in the Amazon. To achieve equity and address historical imbalances, jurisdictional REDD+ programs require FPIC at the initiation of the process. This ensures the extensive participation of civil society, particularly those with a proven track record of forest protection, such as indigenous peoples and traditional communities. The goal is to empower civil society by guaranteeing their inclusion in all program development phases alongside government agencies. However, even though environmental governance for the REDD+ program has increased in ways to assure and enforce participation in decision-making processes, there is a concern about procedural justice, which is "the ability to participate in and influence decision-making processes" (p. 38) [25]. Data from interviews suggest that jurisdictional programs are susceptible to change during electoral cycles, similar to many public policies contexts. This can lead to the dismantling of established due diligence procedures. The interviews also revealed instances of resource misuse (e.g., REDD+ funds used for road construction), low transparency and accountability. Reports indicate potential geographical bias in program implementation, regarding participation and benefits distribution focusing on areas near state capitals and favoring groups aligned with the current administration [24]. Additionally, concerns exist about the lack of robust outcome indicators to measure the program's effectiveness on deforestation and fire reduction rates, forest permanence, additionality, leakage (PAV), and double carbon counting problems. The difficulty of measuring the impact of public policies is a recognized challenge in the political science literature [23]. Providing spheres of participation and governance structures that consider councils and facilitate benefits sharing dialogue does not represent a real change in environmental justice in terms of justice distribution [24]. Procedural justice elements have to be considered in order to translate participation into meaningful engagement. Difficulty in accessing documents that report jurisdiction program expenses and investments, board meeting minutes, or reports about carbon and non-carbon indicators and outcomes, meant that the article's data analysis and discussion had to rely on interviews with social actors, secondary data reports from NGOs, and published articles, reducing the potential accuracy of the jurisdiction REDD+ analysis.

By contrast, voluntary REDD+ projects' transparency efforts were higher. For these, it was standard to provide all project documentation in English, available for download on project websites.This passive transparency was important to acquire more information about these projects. Audit reports were extremely important to understand project deficiencies and their need to improve, although report quality in terms of data collection robustness and analysis varied enormously. The interviews and articles examined highlighted concerns about safeguards compliance in terms of procedural justice, benefit sharing, and participation. Currently, these projects are identified as lacking FPIC processes, social participation, and benefits sharing. As market-driven projects, due diligence processes regarding deforestation leakage, forest permanence, and human rights indicators are tied to projects' finance accomplishments. If the carbon price goes down, the monitoring, evaluation and report process of these projects suffers. The research suggested that voluntary REDD+ programs often face limitations in achieving a power equilibrium between investors and local stakeholders. Investors might be wary of sharing information freely due to concerns about trust and misuse. While standards mandate public access to project documentation, this transparency does not always translate into meaningful changes to improve project practices. Four main limitations are apparent as follows: (1) language barriers, (2) limited understanding of REDD+ mechanisms, (3) limited participatory approaches; and (4) variable audit quality. Firstly, project documents are often in English, creating a knowledge gap for local social movements in Brazil. Effective participation requires skills in content evaluation, report production, and English fluency, which may not be readily available at the local level. Even though some documents are translated from English to

Portuguese, there is little concern about the literacy level of the frontline communities, and lack of attention to cultural constraints affecting understanding.

Secondly, successfully navigating the program requires comprehension of REDD+ project structures and specific standard evaluation processes. This includes knowledge of third-party audit schedules, their role in monitoring compliance, and how they suggest modifications based on project results, stakeholder interviews, and on-site monitoring. Thirdly, concern has been raised about frontline communities participation in REDD+ voluntary projects. FPIC processes are required for standards acceptance of the project. However, consent that "grants some power and authority to communities in the decision-making" normally translates into consultation "only requires sharing information" [25]. The lack of an external body that can exercise significant power over project finance, management, and the development process, in comparison with jurisdictional REDD+, reduces the potential for voluntary REDD+ projects to improve participation towards achieving procedural justice. Fourth, the project report heavily relies on the auditing company's institutional policies and thoroughness in analyzing facts. While these companies undergo certification and regular evaluations, the quality of their reports can vary significantly, potentially affecting the standard's final project assessment. Improvement in standard methodologies and minimum standards for third-party consultancy companies report quality may be possible solutions for improving outcomes regarding due diligence mechanisms for procedural justice.

6. Conclusions

As the end of the period of application of the Kyoto Protocol approaches, countries in the global south with tropical forests will come together to create an alternative mechanism that could meet the demand for mitigating greenhouse gases through the maintenance of tropical forests. REDD+ appears as a possible supplementary mechanism to the CDM. Although the CfRN has strived over the years to approve REDD+ as a binding mechanism at the UNFCCC level, the Copenhagen Agreement (COP15) ended up not including it as a UN mechanism. The lack of a binding multilateral mechanism has made REDD+ a boundary object whose meaning, concepts, and arrangements are defined in the concrete operationalization of each project's activities. This has been a driving force behind the emergence of different institutional arrangements linked to the mechanism. This generated a process of drifting and conversion of the initial proposal designed for the mechanism, which resulted in a multiplicity of institutional arrangements that are considered within the REDD+ umbrella. Currently, REDD+ projects vary according to six types of institutional arrangement that are combined in different ways: (1) safeguards and benefits sharing, (2) financial models, (3) measurement methodologies, (4) ecosystem service type, (5) ecosystem service ownership, and (6) governance levels. All are considered in this article, detailing jurisdictional and voluntary REDD+ projects in terms of procedural justice in environmental goods distribution [24]. Although these advances have generated a feeling of greater socio-environmental justice in REDD+ projects, their real impact on the well-being of frontline communities that depend on the forest as the territory of their material and immaterial existence is controversial. There is still a lot of progress to be made in reflecting on the institutional arrangements that can best serve the reality of tropical forests and their peoples. The withdrawal by the state or the market in order to restrict the open access to which tropical forests are subject is evident in the documents analyzed. Multilevel governance poses the challenge of creating decision-making and social participation arrangements in the face of the multiplicity of actors involved in these projects, from the international to the local level. Lack of transparency in jurisdictional programs has impeded the production of a more accurate analysis of outcomes and impact regarding programs' effectiveness in terms of deforestation and fire reduction rates, forest permanence, PAV indicators, and double carbon counting problems. By contrast, passive transparency is high in voluntary REDD+ projects, as the standards require information sharing for third-party accountability. Interview data and article review presented an acute problem regarding safeguards required in

terms of FPIC, participation, and benefits sharing. The lack of an external body that can exercise significant power over project finance, management, and development processes, in comparison with jurisdictional REDD+, reduces the voluntary REDD+ possibilities to improve participation towards procedural justice. Differences in voluntary standard methodologies and accountability regarding FPIC and social participation, and lack of a benefits sharing body that can exercise significant power over project finance, management, and development processes, in comparison with jurisdictional REDD+, reduces the voluntary REDD+ possibilities to improve participation towards procedural justice. Standard methodology improvement and requirements for a robust audit process may improve outcomes regarding due diligence mechanisms for procedural justice. Further research should include a systematic analysis of due diligence mechanisms for procedural justice of all existing voluntary REDD+ project standards. More research is needed to understand how jurisdiction REDD+ programs actually impact frontline communities with regard to benefit sharing, forest permanence, additionality, and double carbon counting problems.

Author Contributions: Conceptualization, K.S.-D.; methodology, K.S.-D. and C.B.-R.; software, K.S.-D.; validation, P.S.; formal analysis, K.S.-D. and C.B.-R.; investigation, K.S.-D.; resources, K.S.-D.; data curation, K.S.-D.; writing—original draft preparation, K.S.-D.; writing—review and editing, P.S., K.S.-D. and C.B.-R.; visualization, P.S.; supervision, P.S.; project administration, K.S.-D.; funding acquisition, P.S. and K.S.-D. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by CAPES and Instituto Fronteiras.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data are contained within the article.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

PES	Payment for ecosystem services
UNFCCC	United Nations Framework Convention on Climate Change
COP	Conference of the Parties
REDD+	Reducing Emissions from Deforestation and Forest Degradation
PAV	Permanence, additionality, and leakage
NGO	Non-governmental organization
CDM	Clean Development Mechanism
KP	Kyoto Protocol
CER	Certified Emission Reduction
MRV	Monitoring, verification, and reporting
CfRN	Coalition for Rainforest Nations
VCS	Verified Carbon Standard

References

1. Angelsen, A. *Moving Ahead with REDD: Issues, Options and Implications*; Center for International Forestry Research: Bogor, Indonesia, 2008; pp. 1–150.
2. Angelsen, A.; Brockhaus, M.; Sunderlin, W.D.; Verchot, L.V. *Analyzing REDD+: Challenges and Choices*; Angelsen, A., Ed.; Center for International Forestry Research: Bogor, Indonesia, 2012; pp. 1–334.
3. Angelsen, A.; Martius, C.; De Sy, V.; Duchelle, A.E. (Eds.) *Transforming REDD+: Lessons and New Directions*; Center for International Forestry Research: Bogor, Indonesia, 2018; pp. 1–334.
4. Pistorius, T. From RED to REDD+: The Evolution of a Forest-Based Mitigation Approach for Developing Countries. *Curr. Opin. Environ. Sustain.* **2012**, *4*, 638–645. [CrossRef]
5. Azam, M. A Journey from Rio to Paris via Kyoto to Facilitate Technology Transfer to the LDCs under the UNFCCC. *J. Prop. Plan. Environ. Law* **2021**, *13*, 60–84. [CrossRef]

6. Boissière, M.; Beaudoin, G.; Hofstee, C.; Rafanoharanaa, S. Participating in REDD+ Measurement, Reporting, and Verification (PMRV): Opportunities for Local People? *Forests* **2014**, *5*, 1855–1878. [CrossRef]
7. Vijge, M.J.; Brockhaus, M.; Di Gregorio, M.; Muharrom, E. Framing National REDD+ Benefits, Monitoring, Governance, and Finance: A Comparative Analysis of Seven Countries. *Glob. Environ. Chang.* **2016**, *39*, 157–168. [CrossRef]
8. McDermott, C.L.; Coad, L.; Helfgott, A.; Schroeder, H. Operationalizing Social Safeguards in REDD+: Actors, Interests and Ideas. *Environ. Sci. Policy* **2012**, *21*, 63–72. [CrossRef]
9. North, D. *Institutions, Institutional Change and Economic Performance*; Cambridge University Press: Cambridge, UK, 1990.
10. Ostrom, E. *El Gobierno de los Bienes Comunes: La Evolución de las Instituciones de Acción Colectiva; trd. y rev. téc. de Leticia Merino Pérez*, 2nd ed.; Instituto de Investigaciones Sociales (IIS) Universidad Nacional Autónoma de México (UNAM) Fondo de Cultura Económica (FCE): Ciudad de México, México, 2011; pp. 1–403.
11. Rhodes, R.; Binder, S.A.; Rockman, B.A. *The Oxford Handbook of Political Institutions*; OUP Oxford: New York, NY, USA, 2008; pp. 1–403.
12. Hesse-Biber, S.N.; Johnson, R.B. (Eds.) *The Oxford Handbook of Multimethod and Mixed Methods Research Inquiry*; Oxford University Press: New York, NY, USA, 2015; Volume 1, pp. 1–717.
13. Boland, A.; Dickson, R.; Cherry, G. (Eds.) *Doing a Systematic Review: A Student's Guide*, 2nd ed.; SAGE Publication: London, UK, 2017; pp. 1-304, ISBN 9781526416582.
14. Toledo, R.F.; Giatti, L.L. Challenges to Participation in Action Research. *Health Promot. Int.* **2014**, *30*, 162–173. [CrossRef]
15. Lueders, J.; Horowitz, C.; Carlson, A.; Hecht, S.B.; Parson, E.A. The California REDD+ Experience: The Ongoing Political History of California's Initiative to Include Jurisdictional REDD+ Offsets within Its Cap-and-Trade System. *Cent. Glob. Dev. Work. Pap.* **2014**, *386*, 1–34. [CrossRef]
16. Bos, A.B.; Duchelle, A.E.; Angelsen, A.; Avitabile, V.; De Sy, V.; Herold, M.; Joseph, S.; de Sassi, C.; Sills, E.O.; Sunderlin, W.D. Comparing Methods for Assessing the Effectiveness of Subnational REDD+ Initiatives. *Environ. Res. Lett.* **2017**, *12*, 074007. [CrossRef]
17. Schwade, T.M.M. A Formação da Propriedade Capitalista No Amazonas. Ph.D. Thesis, Universidade Federal do Amazonas, Manaus, Brazil, 2019.
18. Pistorius, T.; Reinecke, S.; Carrapatoso, A. A Historical Institutionalist View on Merging LULUCF and REDD+ in a Post-2020 Climate Agreement. *Int. Environ. Agreem. Polit. Law Econ.* **2017**, *17*, 623–638. [CrossRef]
19. Guerra, R.; Moutinho, P. Challenges of Sharing REDD+ Benefits in the Amazon Region. *Forests* **2020**, *11*, 1012. [CrossRef]
20. Atmadja, S.S.; Duchelle, A.E.; De Sy, V.; Selviana, V.; Komalasari, M.; Sills, E.O.; Angelsen, A. How Do REDD+ Projects Contribute to the Goals of the Paris Agreement? *Environ. Res. Lett.* **2022**, *17*, 044038. [CrossRef]
21. Jespersen, K.; Gallemore, C. The institutional work of payments for ecosystem services: Why the mundane should matter. *Ecol. Econ.* **2018**, *146*, 507–519. [CrossRef]
22. Hodgson, G.M. What Are Institutions? *J. Econ. Issues* **2006**, *40*, 1–25. [CrossRef]
23. Mahoney, J.; Thelen, K. (Eds.) *Explaining Institutional Change: Ambiguity, Agency, and Power*; Cambridge University Press: New York, NY, USA, 2010; pp. 1–178.
24. Coolsaet, B. (Ed.) *Environmental Justice: Key Issues*; Routledge: Abingdon, UK; New York, NY, USA, 2020; pp. 1–341.
25. Suiseeya, K.R.M. Procedural justice matters: Power, representation, and participation in environmental governance. In *Environmental Justice*; Routledge: Abingdon, UK; New York, NY, USA, 2020; pp. 37–51.
26. Thornton, P.H.; Ocasio, W. Institutional Logics in Action. In *The Sage Handbook of Organizational Institutionalism*; Greenwood, R., Oliver, C., Sahlin, K., Suddaby, R., Eds.; Springer International Publishing: Cham, Switzerland, 2008; pp. 99–128.
27. Hoogstraaten, M.J.; Frenken, K.; Boon, W.P. The Study of Institutional Entrepreneurship and Its Implications for Transition Studies. *Environ. Innov. Soc. Transit.* **2020**, *36*, 114–136. [CrossRef]
28. Kohl, C.; McIntosh, E.J.; Unger, S.; Haddaway, N.R.; Kecke, S.; Schiemann, J.; Wilhelm, R. Online Tools Supporting the Conduct and Reporting of Systematic Reviews and Systematic Maps: A Case Study on CADIMA and Review of Existing Tools. *Environ. Evid.* **2018**, *7*, 8. [CrossRef]
29. Moutinho, P.; Guerra, R. *REDD Program for Early Movers-REM: Stock and Flow Approach to Benefit Sharing in REDD Programs: Concept and Practice in REDD Implementation in the State of Acre*; IPAM: Brasilia, Brazil, 2017.
30. Bastos, L.; Mairon, G.; Ingrid, J. Visseren-Hamakers, Josefina Braña-Varela, Aarti, G. A Reality Check on the Landscape Approach to REDD+: Lessons from Latin America. *For. Policy Econ.* **2017**, *78*, 10–20. [CrossRef]
31. Demaze, M.T. REDD+ in Brazil: A Profusion of Pilot Projects with an Institutional Framework Still under Construction. *Bois ForêTs Trop.* **2013**, *316*, 17–33.
32. Olawuyi, D.S. Climate Justice and Corporate Responsibility: Taking Human Rights Seriously in Climate Actions and Projects. *J. Energy Nat. Resour. Law* **2016**, *34*, 27–44. [CrossRef]
33. Barbier, E.B.; Tesfaw, A.T. Can REDD+ Save the Forest? The Role of Payments and Tenure. *Forests* **2012**, *3*, 881–895. [CrossRef]
34. Streck, C. Who Owns REDD+? Carbon Markets, Carbon Rights and Entitlements to REDD+ Finance. *Forest* **2020**, *11*, 959. [CrossRef]
35. Valle, R.S.T. *Avoided Deforestation and Indigenous Peoples: Experiences, Challenges and Opportunities in the Amazon Context*; Instituto Socioambiental and Forest Trends: São Paulo, Brazil, 2010; pp. 1–148.

36. De la Mora-De La Mora, G. Conceptual and Analytical Diversity of Environmental Governance in Latin America: A Systematic Review. *Environ. Manag.* **2022**, *71*, 847–866. [CrossRef] [PubMed]
37. World Bank Group. *Blockchain and Emerging Digital Technologies for Enhancing Post-2020 Climate Markets*; World Bank Group: Washington, DC, USA, 2018.
38. Paiva, R.; Garcia, J.R.; Maia, A.G.; Romeiro, A.R. Blockchain Technology and Complex Flow Systems as Opportunities for Water Governance Innovation. *Braz. J. Innov.* **2022**, *18*, 157–176.