
MULTI-STAKEHOLDER PARTNERSHIPS IN AGRICULTURAL COMMODITY SUPPLY CHAINS AND DEFORESTATION-FREE COMMITMENTS IN THE AMAZON: A DELICATE BALANCE

PARCERIAS MULTI-ATORES EM CADEIAS DE ABASTECIMENTO DE COMMODITIES AGRÍCOLAS E COMPROMISSOS LIVRES DE DESMATAMENTO NA AMAZÔNIA: UM EQUILÍBRIO DELICADO

ALIANZAS MULTI-ACTORES EN CADENAS DE SUMINISTRO DE PRODUCTOS AGRÍCOLAS Y COMPROMISOS LIBRES DE DEFORESTACIÓN EN LA AMAZÔNIA: UN DELICADO EQUILÍBRIO

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ABSTRACT: Multi-stakeholder commitments to end deforestation have increased since the UN Climate Summit (UNCS) in 2014, where many agreed to halve deforestation by 2020 and end it by 2030. In addition to being absent among the signatories of the NYDF 2014, Brazil has failed in its voluntary commitment to eliminate deforestation and restore national biomes, despite having achieved considerable success in the last 15 years. In this research, we discuss historical challenges, bottlenecks, and lessons learned about deforestation-free commitments at the local level, and the establishment of sustainable agricultural commodity supply chains. The concept of "agricultural-forest frontier fluidity," in the field of governance (sustainability governance), seeks to contextualize the multi-actor dynamics given the social and environmental costs of occupying the territory, territorial development patterns, governance, and economic activities. We apply a qualitative approach, based on the review of the Brazilian environmental legislation and agreements between 2011-12 and 2017-18. We examined the interactions and dependencies of the soy and beef supply chains and land-use change (according to data from MAPBiomas) to access productive territorial dynamics regarding these commitments at the local level in the Brazilian Amazon. Before the many policies and institutional changes that occurred in Brazil with the newly-elected government since 2019, reinforcing an already existing trend of dismantling the delicate

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balance between command and control policies, governance, and institutional frameworks in the Brazilian Amazon, negatively impacting the performance of agricultural commodity supply chains and free-deforestation commitments.

Keywords – Public Policies, REDD+, Government Environmental Policy, International Linkages to Development, Productive Dynamics, Agricultural-Forest Frontier Fluidity,

RESUMO: Os compromissos multi-atores para acabar com o desmatamento aumentaram desde a Cúpula do Clima da ONU (UNCS) em 2014, onde muitos concordaram em reduzir pela metade o desmatamento até 2020 e encerrá-lo até 2030. Além de estar ausente entre os signatários do NYDF 2014, o Brasil falhou em seu compromisso voluntário de eliminar o desmatamento e restaurar os biomas nacionais, apesar de ter alcançado considerável sucesso nos últimos 15 anos. Nesta pesquisa, discutimos desafios históricos, gargalos e lições aprendidas sobre compromissos livres de desmatamento no nível local e o estabelecimento de cadeias de suprimentos sustentáveis de produtos agrícolas. O conceito de "fluidez da fronteira agrícola-florestal", encontrado no campo da governança (governança da sustentabilidade), busca contextualizar a dinâmica de múltiplos atores, dados os custos sociais e ambientais da ocupação do território, em termos de padrões de desenvolvimento territorial, governança e atividades econômicas. Aplicamos análise qualitativa, com base na revisão da legislação e acordos ambientais brasileiros entre 2011-12 e 2017-18. Examinamos as interações e dependências das cadeias de fornecimento de soja e carne bovina e as mudanças no uso da terra (de acordo com dados do MAPBiomas) para acessar a dinâmica territorial produtiva em relação a esses compromissos no nível local na Amazônia brasileira. Anteriormente às muitas mudanças institucionais e políticas que ocorreram no Brasil com o governo recém-eleito a partir de 2019, reforçando uma tendência já existente de dismantelar o delicado equilíbrio entre políticas de comando e controle, governança e estruturas institucionais na Amazônia brasileira, impactando negativamente o desempenho das cadeias de suprimentos de commodities agrícolas e compromissos livres de desmatamento.

Palavras-chave – Políticas Públicas, REDD +, Política Ambiental de Governo, Relações Internacionais com o Desenvolvimento, Dinâmica Produtiva, Fluidez da Fronteira Agrícola-Florestal,

RESUMEN: Las alianzas multi-actores para terminar con la deforestación han aumentado desde la Cumbre Climática de la ONU (UNCS) en 2014, donde muchos acordaron reducir a la mitad la deforestación hasta 2020 y terminarla hasta 2030. Además de estar ausente entre los signatarios de NYDF 2014, Brasil ha fallado en su compromiso voluntario para eliminar la deforestación y restaurar los biomas nacionales, a pesar de haber logrado un éxito considerable en los últimos 15 años. En esta investigación, discutimos desafíos históricos, cuellos de botella y lecciones aprendidas sobre compromisos libres de deforestación a nivel local, y el establecimiento de cadenas de suministro de productos agrícolas sostenibles. Adoptamos el concepto de "fluidez de la frontera agrícola-forestal", que se encu-

entra en el campo de la gobernanza (gobernanza de la sostenibilidad), y busca contextualizar la dinámica de múltiples actores dados los costos sociales y ambientales de ocupar el territorio, en términos de patrones de desarrollo territorial, gobernanza y actividades económicas. Aplicamos un enfoque cualitativo, basado en la revisión de la legislación y los acuerdos ambientales brasileños entre 2011-12 y 2017-18. Examinamos las interacciones y dependencias de las cadenas de suministro de soya y carne y el cambio en el uso de la tierra (según los datos de MAPBio-mas) para acceder a dinámicas territoriales productivas con respecto a estos compromisos a nivel local en la Amazonía brasileña. Anteriormente a los numerosos cambios institucionales y políticos que ocurrieron en Brasil con el gobierno recién elegido desde 2019, que reforzaron una tendencia ya existente de dismantlar el delicado equilibrio entre las políticas de comando y control, la gobernanza y los marcos institucionales en la Amazonía brasileña, impactando negativamente el desempeño de las cadenas de suministro de productos agrícolas y compromisos libres de deforestación.

Palabras clave – Políticas Públicas, REDD+, Política Ambiental Gubernamental, Vínculos Internacionales con el Desarrollo, Dinámica Productiva, Fluidez de la Frontera Agrícola-Forestal,

1 INTRODUCTION

Multi-stakeholder commitments to support deforestation-free commitments by the private sector and governments have increased since the United Nations Climate Summit (UNCS) in 2014 (NYDF, 2014). As a result, several countries, organizations, companies, indigenous groups, and civil society associations have agreed to reduce deforestation by half by 2020 and end it entirely by 2030. Worldwide, 447 companies have made 760 commitments to reducing deforestation impacts in their commodity supply chains, dependent on palm, timber and pulp, soybean, and cattle (DONOFRIO *et al.*, 2017).

Since 2004, Brazil had achieved dramatic success² In the reduction of deforestation rates, when it dropped from 27,772 square kilometers (sq km) to 19,014 sq km in 2005 (INPE, 2019), despite high beef and soy prices (BOUCHER *et al.*, 2013). Although Brazil was not among the signatories of the New York Declaration on Forests in 2014 (NYDF), the deforestation rates showed a clear sign of reaching its lowest year's growth percentage in the period, achieving a decrease to 4,571 sq km of forest loss in 2012, (INPE, 2019; ESCOBAR, 2020). Due to an excellent combination of remote sensing technologies, improved data collection, and better environmental management, combined with political and financial coordination and sophisticated means of policy implementation developed, especially at the local level (PMV, 2017; INPE, 2019; IPAM, 2019; FERREIRA COSTA, 2020; BNDES, 2020).

However, from 2013, amid a period of economic crisis and deteriorating commitment to environmental regulation, Brazilian deforestation rates jump back up to near pre-reform levels, reaching 5,891 sq km (IPAM/IMAZON/ISA, 2013; BURGESS *et al.*, 2019; INPE, 2019). Further, the country experienced another deforestation surge in 2016 (7,893 sq km) (INPE,

² In the last 15 years, the annual Amazon deforestation rate had fallen from 27,800 km² (in 2004) to 5,000 to 6,000 km² (between 2012 and 2015), while both agricultural production and GDP have increased substantially (IPAM, 2019; INPE, 2019).

2019), followed by another deforestation peak between August 2018 and July 2019, when deforestation rates reached 9,762 sq km –an increase of 30% over the previous year (IPAM, 2019; INPE, 2019). Nothing indicates a change in the short term, and deforestation in 2020 should exceed that observed in 2019 (MAPBIOMAS, 2020).

In this regard, this paper discusses historical challenges, bottlenecks, and lessons learned about multi-stakeholder partnerships aimed at sustainable agricultural supply chain implementation and deforestation-free commitments in Brazil by examining the interactions and dependencies of the soy and beef supply chains in the Brazilian Amazon, between 2011-12 and 2017-18 period, under the productive territorial dynamics concept of agricultural-forest frontier fluidity, as described by Becker (2001), Pacheco (2012), and Gardner & Godar (2014), based on a local level environmental governance program created in Pará state, Brazil, in 2011, and agricultural commodity moratoria. Therefore, we cross information on deforestation rates collected from PRODES (2020), and MAPBiomas (2020), to contribute knowledge and innovative discussions for combating deforestation while accelerating multi-stakeholder partnerships discussions at the local level, and to inform policy and action for forest governance in agricultural-forest frontiers worldwide.

2 MATERIAL AND METHODS

This paper sought to highlight the solutions for the prevention and control of deforestation developed in Brazil, at the local level, under the policy framework of multi-stakeholder commitments to end deforestation and land degradation in the Brazilian Amazon –the Green Municipalities Program (Programa Municípios Verdes –PMV), including agricultural supply chain moratoria agreements (soy and beef), from 2011 to 2017. We addressed the benefits and the bottlenecks of enforcing deforestation-free commitments in compliant municipalities in the state of Pará, Brazil, by examining the diversity of interactions and dependencies of multi-level actor agreements found in the Amazon agricultural-forest frontier and their implications for the complexity of interactions for forest governance, deforestation, land degradation, and the establishment of sustainable agricultural commodity supply chain in a broader perspective. This research relies on the concept of agricultural-forest frontier fluidity, as described by Becker³ (2001), Pacheco⁴ (2012), and Gardner and Godar⁵ (2014), in the field of studies of governance (sustainability governance), and seeks to contextualize the multi-actor dynamics related to the social and environmental costs of occupying the territory, in terms of patterns of territorial development, governance, and economic activities connected to soy, cattle, and land-use change.

Through an overview of these above mentioned multi-stakeholder partnerships, actions and its policy guidelines, and combined with a review of international, national, and sub-nati-

³ Agricultural-forest frontier fluidity addresses the understanding and the development of what has come to be called the human dimensions of global environmental change; the pace, institutional framework, terrestrial extent and (relative) success of these developments (Becker, 2001).

⁴ Addresses the concept of frontier expansion in the Brazilian Amazon as a process that depends on multiple exogenous and endogenous factors operating at diverse scales, but whose trajectory depends on the dominant actor type (smallholders or medium- or large-scale landholders) occupying the frontier landscape, related to deforestation activity and expansion of cattle ranching operations (Pacheco, 2012).

⁵ Address sustainability governance in agricultural-forest frontiers, areas that still retain large forest areas, yet deforestation continues through agricultural expansion (Gardner and Godar, 2014).

onal climate and environmental policies and practices, the article sought to incorporate environmental and sustainability governance interplays with agricultural commodity supply chain and deforestation-free commitments in the agricultural-forest frontier in the Brazilian Amazon. The research highlighted the process of developing multi-stakeholder partnerships at the local level. It showcased its principal characteristics, by addressing the development and implementation of a modern financial, technical, and political structures that created the right conditions for the emergence of this innovative policy framework in Brazil, between the 2011-12 and 2017-18 period. Lastly, the paper examined the lessons learned, discussed some bottlenecks, and provided some analysis on the ways that multi-stakeholder partnerships could evolve further, even though policy and institutional changes have been reinforcing an already existing trend of dismantling of the delicate balance between command and control policy and institutional frameworks in the Brazilian Amazon. It is a qualitative research based on text and document analysis, presenting maps and statics on land use and land cover data for the period mentioned above, aimed at providing a cost-effective way of gaining a broad understanding of the current research questions.

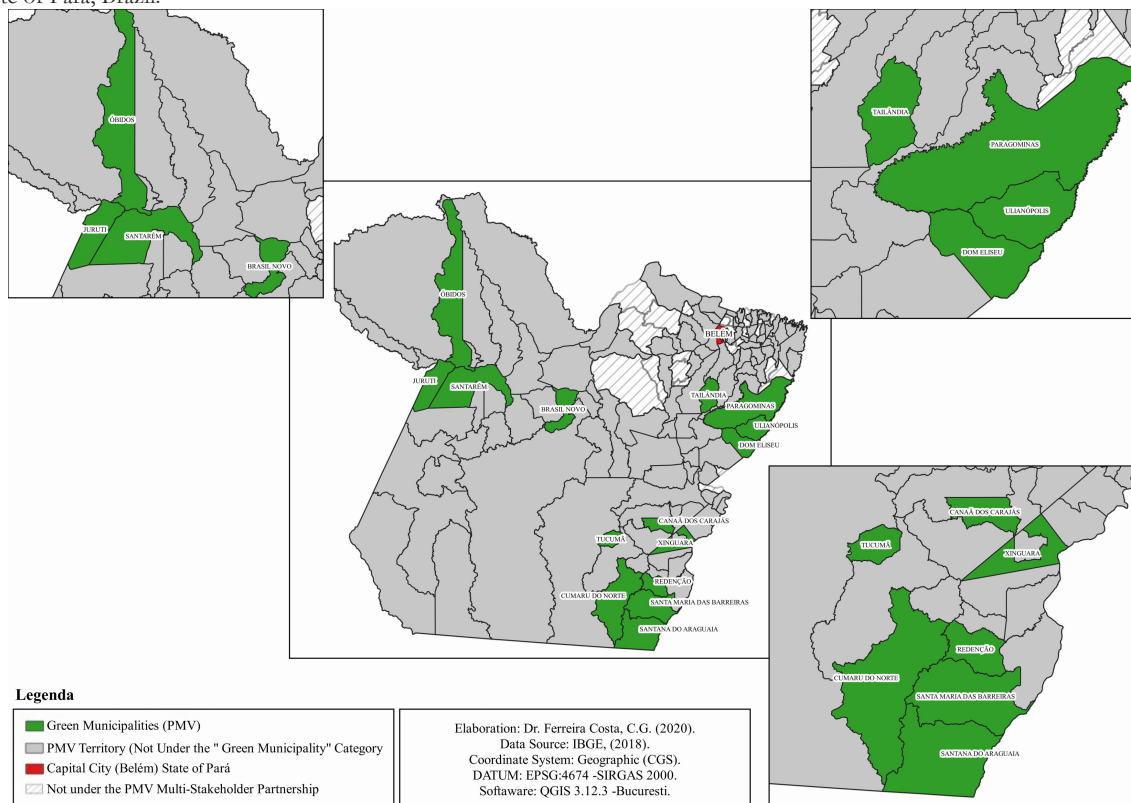
To contextualize the adopted approach, we present data and information on annual land-use change and land cover data for the 2012-18 period after the Forest Code (2012). Moreover, we included a Sankey Transitions Diagram to explore the dynamics of land-use change for the 2012-2018 period for the State of Pará –after the approval of the forest code –, according to MAPBiomas methodology, with data from MapBiomas collection 4.1 (2020). Besides, the paper uses maps for better visualization of the distribution of the multi-stakeholder partnership on the territory. For this, the QGIS software, version 3.12.3 -Bucaresti, was used. The data source for shapefiles used was IBGE (2018). The reference system was the Geographic Coordinate System DATUM EPSG:4674-WGS84 used to compose the study areas' delimitation. General maps display the state of Pará, indicating its capital city, as well as the distribution of the municipalities in the territory, to facilitate identification and observation of the study area. This approach provided a useful geographic lens to locate socioeconomic fluidity and environmental degradation expansion in the territory. The paper analyzed the Brazilian environmental legislation, and the PMV database (PMV, 2017; 2018) –correlating six different types of reports to access a wide range of environmental, social, and territorial data and information in the 144 municipalities of the state of Pará.

The research focused on the comparative aspect of the PMV reports and discussed the Rural Environmental Registry (CAR –Cadastro Ambiental Rural, in Portuguese) for the period mentioned earlier. We address deforestation rates (PRODES, 2020; MAPBIOMAS, 2020), municipal environmental management, and information on the local level adhesion and means of implementation of multi-stakeholder partnerships (PMV, 2017; 2018), in 15 Municipalities⁶ (under the category “Green Municipality”), complying with the program's strict environmental rules and procedures during the investigated period (PMV, 2018) (Figure 1). The paper understands territories described by the PMV, under environmental categories: consolidated, embargoed, forestry, Green Municipalities (Município Verde), under pressure, and undefined municipalities. It helped us focus on the municipalities under the category of Green Municipalities, to present data on land-use change graphically, according to the MAPBiomas, (2020), as the selected actors demonstrate higher environmental standards management and compli-

⁶ Brasil Novo; Canaã dos Carajás; Cumarú do Norte; Dom Eliseu; Juruti; Óbudos; Paragominas; Rendenção; Santa Maria das Barreiras; Santana do Araguaia; Santarém; Tailândia; Tucumã; Ulianópolis; Xinguara (PMV, 2017)

ance, and efforts to reduce deforestation and land degradation. Besides, to complement the analysis, we drew from a wide range of sources, information and relevant textual data collected from official channels of the Brazilian government, the state government of Pará, municipal indicators, Imazon technical reports, scientific literature reviews, and institutional communications about multi-stakeholder partnerships such as the PMV, and agricultural supply chain agreements (soy and beef).

Figure 1. Geographic Location of the "Green Municipalities" in the Territory of the Multi-Stakeholder Partnership of the PMV, in the State of Pará, Brazil.



Source: PMV, (2017)

2.1. Antecedents

The framework discussed in this paper was motivated by the successful experience of a multi-stakeholder commitment to end deforestation established in a municipality of the State of Pará, Brazil –Paragominas. This municipality adopted procedures for environmental regularization in response to federal actions to control deforestation (WHATELY and CAMPANILI, 2014). In the past, Paragominas was notorious for its high deforestation rates, widespread illegal timber activities, and social violence (PIKETTY *et al.*, 2015). Launched in March 2011, the PMV was created (State Decree 54/2011) (PMV, 2011), as a sub-national response to punitive measures from the national government and the Federal Public Prosecutor's Office of Brazil (MPF) to eliminate deforestation in the Amazon during the first decades of the 21st century. In 2008, the Ministry of Environment of Brazil (MMA) published a Critical Deforestation List (CDL), as a policy measure to combat deforestation, and to evaluate the dynamics of deforestation at the local level in Brazil, based on (a) the total area deforested, (b) total area deforested in the previous three years, and (c) an increase in deforestation rates in at least three

of the past five years (VIANA *et al.*, 2012). It, initially, listed 17 municipalities between 2008 and 2011 that had the highest rates of deforestation in the Amazon; including the local government of Paragominas, that established a strategy aimed to be taken off the CDL and recover its reputation (MPF-PA, 2009; GUIMARÃES *et al.*, 2011). Since then, the multi-stakeholder partnership implementation follows ambitious environmental and economic local level voluntary commitments. Its baseline actions followed the target of reducing deforestation rates, reforestation, or rehabilitating degraded areas, adopting sustainable forest management and ethical farming practices, intensifying land use, and promoting sustainable supply chains and deforestation-free commitments. The actions were implemented and monitored by local-level environmental management programs (municipalities), orienting the goals of the multi-stakeholder partnership among different actors such as civil society, the private sector, and government bodies (at various levels), the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA) and the Federal Prosecution Service of Brazil ('Ministério Público Federal' –MPF; FERREIRA COSTA, 2020).

3 RESULTS AND DISCUSSION

3.1. Legal and Public Policy Environmental Frameworks

Brazil has built a robust legal and public policy environmental framework to guide actions that produce REDD+ results to implement its Nationally Determined Contribution (NDC) regarding Forests⁷ and Agriculture⁸ components (WFR, 2013; MMA, 2019). The National REDD+ Strategy aims at maximizing the positive impacts of the actions in place and promoting synergy and integration among the existing policies and initiatives on various levels; at the Strategic Level: The National Policy on Climate Change and the Forest Code; on the Tactical-Operational Level: National Climate Change Plan and Plans to Prevent and Combat Deforestation (Biome scale); and, regarding Funding: the Amazon Fund, National Climate Change Fund, National Forest Development Fund, and the Amazon Protected Areas Fund (MMA, 2018). Despite the annual fluctuation of deforestation rates in the Brazilian Amazon (Amazônia Legal) –the rate of deforestation estimated by PRODES, in 2016 (7,893 km²), indicated an increase of 29% in the deforestation compared to 2015 (6,207 km²). The data and information from 2017 (6,624 km²) indicated a decrease of 16% compared to 2016, which represented a reduction in the deforestation rates of 76% compared to that recorded in 2004 (27,772 km²) (INPE, 2016; PRODES, 2020); when the federal government started to implement the Plan for Prevention and Control of Deforestation in the Amazon biome. Although, during the period 2012-18, the state of Pará reported deforestation increase (from 1,741 km² to 2,744 km²), an annual deforestation increase of 52% from 2018 to 2019 (4,172 km²) (PRODES,

⁷ (i) Strengthening and enforcing the Forest Code's implementation at federal, state and municipal levels.

(ii) Strengthening policies and measures to achieve, in the Brazilian Amazon, zero illegal deforestation by 2030 and compensate for greenhouse gas emissions from legal suppression of vegetation by 2030.

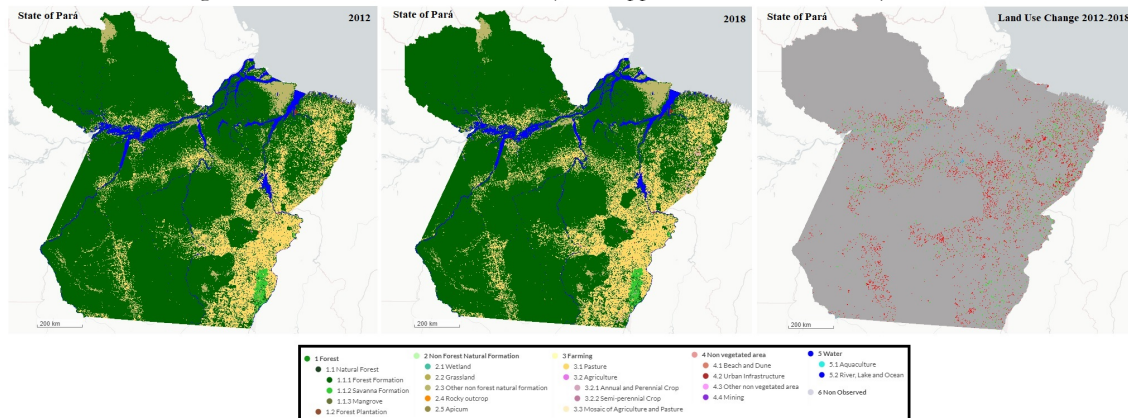
(iii) Restoring and reforestation 12 million hectares of forests by 2030, for multiple purposes; and,

(iv) Enhancing sustainable native forest management systems, through georeferencing and tracking systems applicable to native forest management, to curb illegal and unsustainable practices.

⁸ Strengthen the Low Carbon Emission Agriculture Program (ABC) as the primary strategy for sustainable agriculture development, including by restoring an additional 15 million hectares of degraded pasturelands by 2030 and enhancing 5 million hectares of integrated cropland-livestock-forestry systems (ICLFS) by 2030.

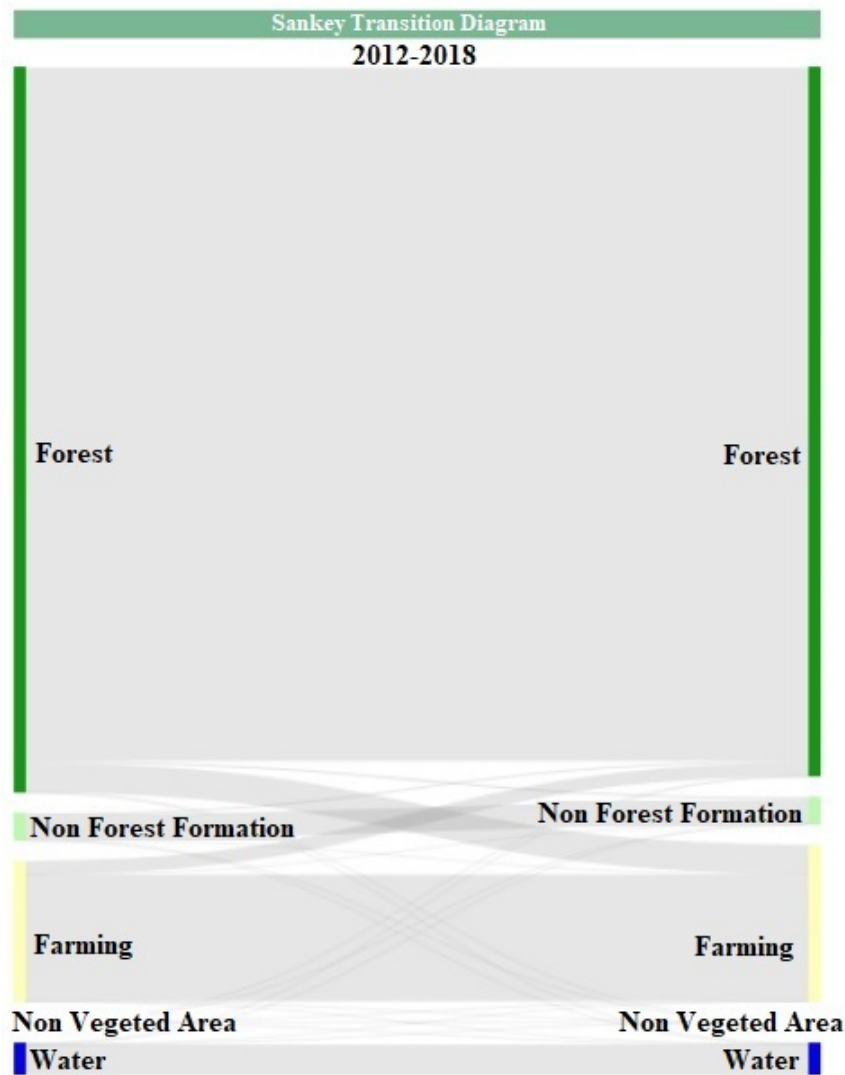
2020) (Figure 2).

Figure 2. Land Use Change in the State of Pará, between 2012 (After Approval of the Forest Code) and 2018



Source: Adapted from MAPBiomias, (2020)

Pará was the Brazilian state with the highest concentration of deforestation (36.4%), followed by Rondônia (18.9%) (PRODES, 2020). In this regard, we included a Sankey Transitions Diagram, to explore the dynamics of land-use change for the period 2012-2018, after the approval of the forest code, for the State of Pará, with data from MapBiomias collection 4.1 (2020) (Figure 3).

Figure 3. Sankey Diagram of Land Use Change Classifications for the State of Pará, between 2012 and 2018

Source: MAPBiomias, (2020)

Nevertheless, on 3 March 2017, Brazil submitted its 2nd Biennial Update Report (BUR), which included the 2nd REDD+ Technical Annex to the United Nations Framework Convention on Climate Change (UNFCCC). Based on the Forest Reference Emission Levels (FREL) for deforestation in the Amazon Biome, Brazil⁹ had measured emissions reduction of 3.154.501.726,77 tCO₂e between 2011 and 2015 (MRE/MCTIC, 2017). Against this framework, the need to reduce emissions from deforestation and forest/land degradation remains urgent; more than ever, as national and international efforts through Brazil's ENREDD+ (2016), the Clean Development Mechanism (CDM) and voluntary carbon markets, and the establishment of carbon pricing in the country (NCCP; 2009; FGV/EASESP, 2018; FAZENDA, 2020; PMR Brazil, 2020), aimed at encouraging complementary activities of forest preservation, reforestation, afforestation, and sustainable land management (GRABOWSKI and CHAZDON, 2012).

⁹ Brazil's Third Biennial Update Report to the UNFCCC was launched in 2019, not considered paper, as we cover the 2011-17 period.

Further, Brazil had proposed and developed a series of incentive mechanisms that aim to maintain adherence to the goals of the environmental legislation (MRE/MCTIC, 2017; MMA, 2017; 2018; 2019). Some of them were still at initial stages during the investigated period, while others were already in place; both have shown promising viability, such as the "Green" ICMS, which enables the distribution of fiscal resources from this tax to the municipality following forest and land conservation and preservation initiatives as well as socio-environmental rules (PENA, 2015; SEMAS, 2015; 2020; PMV; 2017; POZZETTI and CAMPOS, 2017). In this regard, the Green ICMS is an economic instrument of the environmental policy adopted by the Government of Pará. Of the total collected by the state with the tax, 25% goes to the municipalities. The distribution of part of the receipt attends ecological criteria within this percentage, which proposes compensating the municipalities that make an environmental investment for sustainable development. The Green Tax is essential to strengthen the decentralization of environmental management in the municipalities that work to reduce deforestation and reinforce environmental regularization, with the realization of the Rural Environmental Registry (CAR) and the preservation of existing protected territory (SEMAS, 2015; 2020).

Under a similar principle, the FIP Amazônia is an initiative that seeks to reinforce the development of green investments linked to deforestation-free supply chain commitments in the private sector. It is operated by the BNDES (2020) –which is the largest investor in the FIP Fund –, and the Banco do Estado make Pará (Banpará), Acre Development Agency, Jari Group, the Kaeté Investments, and the BTG Pactual DTVM, which acts as the asset manager. The government of Pará state, through the PMV, guaranteed a minimum investment of BRL 20 million (with a possible expansion to BRL 100 million) for companies interested in the capture, development, and operation of green projects in Pará, who complied with PMV rules (AMAZONIA, 2013; PMV, 2017).

3.2. Multi-Stakeholder Partnerships' Benefits –The Adherence to Environmental Conservation and Anti-Corruption Efforts

Between 2011-12 and 2017-18, the multi-stakeholder partnerships in the Amazon biome provided clear long-term advantages such as legal security, economic, political, and fiscal stability, market value, and sustainability governance –to supply chain-related agricultural commodity production in the Amazon Basin (PMV, 2017). The rules of these initiatives, under the PMV, ensured compliance with national and sub-national climate plans and laws (NPCC, 2007; NCCP, 2009; FERREIRA COSTA, 2020). Offering legal stability and access to large retail chains (i.e., the market component), and it kept the gates open to federal and state credit and fiscal incentives, such as the Green ICMS and tax credits –providing rural territorial property and agricultural insurance under lower interest rates) (MPF-PA, 2009). It also eased access to develop policies and technical assistance. In this regard, the compliance with multi-stakeholder partnerships (especially the PMV initiative) reinforced land regularization, under the CAR, in a virtuous circle (GUIMARÃES *et al.*, 2011; VIANA *et al.*, 2012; WHATELY and CAMPANILI, 2014). It promoted the legalization of land tenure and environmental regularization (PMV, 2017). In turn, it generated more significant conditions for economic and fiscal stability, while producers could have the security of being free of penalties, fines, sanctions, and economic and political embargoes. It created the conditions to attract new investments and public and private partnerships (i.e., FIP Amazônia) through redesigning the economic

environment favoring private companies linked to deforestation-free supply chain commitments (AMAZONIA, 2013; BRLTRUST, 2018; BNDES, 2020). These initiatives aimed at contributing to creating new and better jobs, while also contributing to improving income levels, avoiding work in conditions analogous to modern slavery, and ultimately reducing poverty rates and environmental degradation (PMV, 2017; 2018; BNDES, 2020).

Under the multi-stakeholder partnership of the PMV, the market value component connected with environmental sustainability. Any gains in environmental sustainability related to the promotion of modern socio-environmental production bringing economic benefits, not only through image recovery but also by promoting better access to importing countries with strict environmental laws and high-income markets and consumers (PMV, 2017). The PMV ensured access to these benefits by offering better conditions to producers and municipalities to adhere to the CAR, controlling the sustainability of productive dynamics at the municipal level through embargo, credit restrictions, and fines for illegal activities. Moreover, the PMV limited and, in many cases, denied access, from producers exploring areas classified as illegally deforested to the market while offering support to the restoration of degraded land through Environmental Reserve Quotas (PMV, 2017; BNDES, 2020).

In the PMV targeted municipalities in the Pará State, an area corresponded to 408,396,15 km² (71,6%) was registered in the CAR (PARÁ/SEMAS; 2015; PMV, 2017; 2018). Due to the PMV Committees on-the-ground work focusing on the intensification of campaigns to publicize the PMV. Besides, the PMV based such actions on the delivery of measures to improve the collection and management of data and information from rural producers, and incentives to integrate the knowledge in the Integrated System of Monitoring and Environmental Licensing managed by the Environmental Secretary of the State of Pará –SEMAS (FUNDO AMAZONIA, 2014). Complementary interventions, such as national and state forest policies, agricultural commodity moratoria, and third-party certification programs, are now trying to solve policy holes (CHAKRAVARTY *et al.*, 2012; ABRANCHES, 2015; BANDEIRA, 2015; FERREIRA COSTA, 2016).

The voluntary commitments around the PMV acted as a catalyst to combat deforestation and land degradation in the state of Pará by supporting and expanding established multi-stakeholder pacts and federal and state laws and initiatives. At the same time, it was useful in strengthening sustainable rural production through strategic environmental and land management actions aligned with more robust market-oriented environmental governance. These results were possible by strengthening local-level pacts and monitoring deforestation rates by implementing the “Cadastro Ambiental Rural” (CAR) and stimulating the municipal level's environmental management department. The municipalities described as “Municípios Verdes” (Green Municipalities) were systematized according to their characteristics of vegetation cover, deforestation patterns, and environmental and agricultural systems, which allowed the evaluation of performance, while also considered the environmental and economic specifics, and productive dynamics of each municipality (PMV, 2018; FERREIRA COSTA, 2016a; 2020). Another aspect of the PMV is its function as a sub-regional policy with a significant impact on the legalization of land use. Although, the use of such instruments that promote land regularization may facilitate land theft or invasion of unclaimed property. In 2009, the Ministry of Agrarian Development (MDA/INCRA) and the Ministry of the Environment (executed by IBAMA, and ICMBio), set up an initiative to combat that risk by legalizing land tenure, known as the “Arco Verde Terra Legal” (Green Arc Legal Land). The Legislative Pro-

visional Measure No. 458/2009 became Law No. 11,952/2009; this drew together several ministries and federal agencies jointly working with the PMV, to operate at the local level in the municipalities with highest deforestation rates in the states of Amazonas, Maranhão, Mato Grosso, Pará, Rondônia, and Roraima. The work on the regulation of land possessions and actions at the municipal level strengthened supervisory bodies in identifying and punishing environmental crimes in the region (BARRETO and ARAÚJO, 2012; WHATELY and CAMPANILI, 2014). The on-the-ground verification work on deforestation undertaken under the PMV worked as a crucial step in complementing the remote-sensed data and photo interpretation, which helped identify land degradation and new areas of illegal deforestation.

The PMV, as a system of command and control, worked to support federal and state actions aimed at legalizing land tenure and reducing the risk of property theft, executed through an established pact among the actors at federal, state, and municipal level (DA COSTA and FLEURY, 2015). Following the structure as the CDL, the government of the State of Pará set a similar legal instrument to cope with deforestation, by Decree No. 838/2013. It defined a sub-national List of Illegal Deforestation (Lista de Desmatamento Ilegal –LDI) prohibiting permits, authorizations, services, or any other type of public benefit and incentives by entities of the state public administration to companies or activities operating in illegally deforested areas in the state of Pará. It became the Pará state's official consultation tool to cope with deforestation (SEMAS, 2013).

The PMV committee and other institutions and government bodies comprise the technical committee of the LDI (Joint Ordinance SEMAS/PMV No. 04/2014). It defined remote and on-the-ground inspection of activities located in areas illegally deforested in Pará. Over the years of execution, it was a fundamental basis for the continuous improvement of the established multi-stakeholder partnerships under the PMV, and agricultural commodity moratoria, which relied on a series of policy and technical innovations that created a positive dynamic for the expansion of its actions. At the policy level, beef and soybean supply-chain engagements have been encouraged to promote better resource allocation and management of natural resources through the articulation of multi-level stakeholder partnerships, environmental pacts, programs, and new governance schemes (GUIMARÃES *et al.*, 2011; BARRETO and ARAÚJO, 2012; GRABOWSKI and CHAZDON, 2012; VIANA *et al.*, 2012; WHATELY and CAMPANILI, 2014; FERREIRA COSTA, 2020), aimed at addressing deforestation components locally through the signing of Terms of Adjustment of Conduct (known as a 'TAC da Carne' (TAC)) by the meat-packing industry, livestock producers, and soybean farmers (MPF, 2010; PARÁ, 2015).

The first step to adhere to the PMV was the voluntary signing of the Term of Commitment, followed by the signing of the Term of Adherence. These actions sought to provide legal security and political stability to the commitments assumed at the municipal level, keeping the annual deforestation rate below 40 km², owning 80% of the municipal area in the CAR, and not appearing in any of the lists of deforestation in the Amazon (CDL –Federal, and LDI –State). The Executive Committee, coordinated by the Extraordinary Secretary of State for the Coordination of the PMV (SEPMV) and composed of a group of different institutions such as the Economic Development Secretariat, Mining and Energy (Sedeme), Secretariat of Environment and Sustainability (Semas), Rural Producers' Union of the Municipalities, the MPF, Ibama, Institute of Man and the Environment of Amazon (Imazon), and The Nature Conservancy (TNC). Besides, several agencies and institutions were involved in the implementation

of the actions. Among them, the Pará State Technical Assistance and Extension Company (Emater-PA), the Secretariat of Agricultural and Fisheries Development (Sedap), the Land Institute (Iterpa) and the Forestry and Biodiversity Institute of the State of Pará (Ideflor-bio), were responsible for implementing the necessary actions to achieve the socio-environmental goals of the multi-stakeholder partnership, established under the PMV, at the local level.

Many of the actions under the PMV reinforced the decentralization of environmental management as a critical outcome, responding to the 2030 Agenda calls for establishing multi-stakeholder partnerships for sharing knowledge, expertise, technology, and financial resources to support environmental conservation and support diverse SDGs, making progress in the five dimensions of the Sustainable Development Goals –SDGs (UNDESA, 2015). The consolidation of sustainability processes is an ongoing activity among the already qualified municipalities. The training and structuring of the actors for the validation of actions and policies in the field of deforestation empower local actors based on a decentralized architecture according to the seven goals of the PMV (Table 1).

Table 1. Goals for the Municipalities under the Multi-Stakeholder Partnership of the PMV

Goal	Actions
1	Celebrate a local pact against deforestation by promoting broad participation of civil society and local government
2	Create a local working group to combat illegal deforestation and to promote environmental monitoring.
3	Conduct field inspections to avoid illegal deforestation: if it happens, report it to the PMV Executive Committee.
4	Maintain the annual deforestation rate below 40 km ² (based on PRODES/INPE criteria).
5	Have more than 80% of the municipal area registered in the Rural Environmental Registry (CAR).
6	Not to be on the Critical Deforestation List –LDC (MMA), or the List of Illegal Deforestation –LDI (Pará State).
7	To develop a functional Environmental Department at the municipal level.

Source: PMV, (2017)

The PMV's Management Committee (COGES) monitored and validated these goals. Their achievement enabled the municipalities to receive benefits, ranging from federal and state fiscal incentives to environmental protection disbursement, staff training, and support for the Secretariat at the municipal level. It also offered support for the implementation of the CAR, for the sustainability of financial regulations and environmental management and for giving priority to the allocation of public resources to enabled municipalities (PMV, 2017).

The monitoring and validation systems concerning deforestation were related to Goal 4 (above-mentioned) and focused on: Adherence to CAR (periodically released by SEMA); Data on deforestation (released monthly by DATER and SAD; and annually by PRODES/INPE); Monthly bulletins of deforestation outbreaks (produced by SAD/IMAZON); Field verification of deforestation outbreaks generated by any of the actors, and reported to the PMV; Information on municipal empowerment processes for local environmental impact licensing provided by SEMA/DIPLAM; Technical assistance and on-the-ground work (visits) to the municipalities by the PMV Executive Committee. These factors encourage institutions and anti-corruption procedures due to the promotion of checks and balances in the municipalities' social, judicial, political, and economic frameworks.

Under such requirements, the land and forest restoration components of the PMV operated in compliance with Chapter XIII of Law No. 12,651/2012 (Forest Code). In the scope of the Union, the State, and the federal district previously established environmental regularization programs (PRAs). This segment comprised a set of actions and initiatives targeting rural landowners and squatters to adjust and promote environmental regularization under the Environmental Regularization Program (Decree No. 7,830, 17 October 2012). It drove legal ins-

truments on the following requirements: a subscription to CAR; signing of a term of commitment; submission of a project for the re-composition of degraded and altered lands; and the existence of Environmental Reserve Quotas (CRA) –provided by the Forest Code (Article 44, to encourage the preservation and conservation of ecosystems), when applicable. The restoration of a legal reserve should meet the criteria stipulated by the competent body of the Brazilian National Environment System (SISNAMA) and be completed in up to 20 years, covering at least one-tenth of the total area required for its complementation every two years (Art. 66 of Law No. 12,651/2012).

The multi-stakeholder partnership, structured around the PMV goals, aligned strategically with the strengthening and endurance of local-level environmental management. They intended to evolve towards the accomplishment of the planned actions and to support the implementation and validation of CAR in rural properties in the participating municipalities (PMV, 2017; 2018; FERREIRA COSTA, 2020).

3.3 Multi-Stakeholder Partnerships: To The PMV, From Beef to Soybean

For Barreto *et al.* (2017), the relationship between potential zones of cattle purchase with production areas in the Amazon indicates that the slaughterhouse industry can influence an area ranging from a few kilometers up to 360 km for the acquisition of animals. The dynamics that naturally affect deforestation and the problems associated with this practice go way beyond the local. In this regard, the extent to which international and national agricultural commodity supply chain commitments can achieve scale, and environmental and social objectives depend in part on how much "commitments" can interact with sub-national multi-stakeholder partnerships, instruments, laws, programs, and productive dynamics that exceeds the limits of the municipalities alone. During the investigated period, the PMV has proven effectiveness in integrating different stakeholders in diverse groups of towns, promoting sustainable supply chains, and deforestation-free commitments by agricultural commodity producers working beyond the local level. Nevertheless, there is still a long way to go (GUIMARÃES *et al.*, 2011; BARRETO and ARAÚJO, 2012; VIANA *et al.*, 2012; WHATELY and CAMPANILI, 2014; FERREIRA COSTA, 2020).

Most of the multi-stakeholder *initiatives* that interact with the Green Municipalities started before the establishment of the PMV. Notwithstanding, the PMV seemed to work as a catalyst to reinforce these efforts to sign local level commitments. The biggest Brazilian beef companies: Bertin, JBS, Minerva and Marfrig, and export associations, such as the ABEG, and supermarkets signed a TAC for the Beef Sector (MPF-PA, 2009; MPF-MT, 2010; MPF, 2010; PIKETTY *et al.*, 2015). Until 2017, 70% of the slaughter capacity has come from slaughterhouses that signed TACs (AGENCIA PARÁ, 2017). The PMV, due to its on-the-ground verification work on deforestation, has helped maintain these commitments at the local level. The Soy Working Group ABIOVE, ADM, ALGAR, AMAGGI, ANEC, Baldo, BUNGE, CARGILL, IMCPA, Louis Dreyfus Commodities, Oleos Menu; and, international and national NGOs, such as Amigos da Terra, Conservação Internacional, Imaflora, Greenpeace, the Nature Conservancy, WWF Brazil, STTR de Santarém; research bodies such as the IPAM; and the Government (MMA, 2019), joined forces to implement a multi-stakeholder initiative in the fight against deforestation. Larger producers and buyers signed the Soy Moratorium (for

5,000 ha of soybean) forbidding the trade of soybean planted in areas deforested after 24 July 2006; this initiative has been successfully monitored and renewed since 2007 (RUDORFF *et al.*, 2011; GIBBS *et al.*, 2015; ABIOVE, 2019). Since 2014, soybean producers, traders, producers' unions, and public institutions of Pará state introduced a protocol (Soja+), which sought to avoid the commercialization of soybean from illegally deforested areas, favoring landholders registered in CAR in areas free from embargoes by state and federal bodies, and free from working conditions analogous to slavery (PIKETTY *et al.*, 2015; PARÁ/SEMAS, 2015; ABIOVE, 2016).

3.4 Environmental Adherence Mechanisms to Land Regularization

Multi-stakeholder partnerships, such as the PMV and agricultural commodity moratoria, facilitate adherence to CAR; it has already helped more than 80% of rural properties across several partner municipalities to become registered in this platform, assisting farmers to improve their pasture and cattle management (ALVES-PINTO *et al.*, 2015; PARÁ/SEMAS, 2015). It is a significant step forward, as the links between deforestation and land tenure status are undeniable, making up three-quarters of rural properties in the Brazilian Amazon region (MICCOLIS *et al.*, 2014). The PMV works with the CAR according to the Decree No. 7,830/2012 and requests comprehensive information on:

- The owner (rural owner or person responsible for the rural property).
- The respective georeferenced plant of the property perimeter.
- An indication of the areas of social interest and areas of public utility.
- The location of the remaining areas of native vegetation, permanent preservation areas, land under restricted use, consolidated areas, and legal reserves.

Where productive areas do not meet the requirements of the CAR due to untitled land, the PMV has been working to ensure that these properties comply with the provisions of national, state, and municipal laws that support land and environmental regularization. The PMV supports the co-management of natural resources by pooling public and private interests, enabling the implementation of existing environmental protection provisions under the previous environmental policy formulation (PMV, 2017). It helped to leverage environmental mechanisms, such as the Rural Licensing Registry (LAR) and CAR, the promotion of more sustainable beef and soybean value chains (and soy and beef commodity moratoria), the adoption of more sustainable management pacts, while the technical assistance coped with land tenure and environmental regularization at the municipal level (MMA, 2017; 2018; 2019; MPF-PA, 2009; MPF-MT, 2010; ABIOVE, 2016; 2019; ABRAPALMA, 2018; PMV, 2017; 2018).

A suitable example of on-the-ground work executed under the PMV refers to the actions undertaken by its Management and Executive Committees. The Management Committee, known as COGES, handled strategic decisions and validated the program's action plan. It was composed of 21 members, of which 10 were representatives of public bodies and 11 of civil society. In addition to the MPF, the Public Prosecutor's Office of the State of Pará (MPF-PA) and IBAMA played a significant role in command and control actions and information on critical areas of deforestation. The PMV Executive Committee was responsible for the PMV database. It carried out the monitoring of the most recent primary and secondary database

based on data and information collected from several government sources such as IBGE (Agricultural and Demographic Census); Environmental Social Institute (ISA); Ministry of the Environment; State Secretariat of Environment of the State of Pará; Institute of Economic, Social and Environmental Development of the State of Pará (IDESP), and the National Institute for Space Research (INPE).

The voluntary co-management of natural resources coupled with on-the-ground work undertaken by the committees and partners allowed the PMV to implement strategies in line with local realities, cope with local needs, and promote the establishment of more actor-tailored actions and interventions regarding agricultural commodity moratoria in place. It had eased the articulation with international, national, sub-national policies and economic dynamics. Many of them are related to the reinforcement of shared environmental management in groups of similar municipalities as the PMV prioritizes the decentralization of environmental management (GUIMARÃES *et al.*, 2011; BARRETO and ARAÚJO, 2012; VIANA *et al.*, 2012; WHATELY and CAMPANILI, 2014; ALVES-PINTO *et al.*, 2015; PIKETTY *et al.*, 2015; PMV, 2017; 2018; FERREIRA COSTA, 2020).

Different policy actions and industries came into play in a collaborative environment, moving beyond government actions, creating a conducive environment for business, development, and partnerships across actors to prove that more sustainable value chains were possible, by establishing natural resource and land-use management pacts and land regularization. To date, from up 144 municipalities, more than 120 cities had signed up to the PMV. The PMV reported 15 of them as Green Municipalities, complying with the program's strict environmental rules and procedures (PMV, 2018).

3.5 More Influential Institutions and Multi-Stakeholder Partnerships: The Way Forward

Multi-stakeholder partnerships in agricultural commodity supply chain commitments (GIBBS *et al.*, 2015; PIKETTY *et al.*, 2015; ABIOVE, 2016; 2019), must address the productive dynamics that go beyond the limits of the "local" (BARRETO *et al.*, 2017), –not only to achieve scale, but mostly to comply with environmental, climate, and socioeconomic aspects of the 2030 Development Agenda, the Paris Agreement, NDCs, and the NYDC (NYDF, 2014; UNDESA, 2015; DONOFRIO *et al.*, 2017). They must interact with current and future expansion of political and economic forces to evolve and fulfill broader multi-level actor-tailored measures to promote sustainable and fairer solutions to reinforce ongoing supply-chain deforestation-free commitments (PMV, 2018; FERREIRA COSTA, 2016; 2016a; 2020). Besides, to overcome the increase in deforestation and land degradation trends observed since 2013 (IPAM/IMAZON/ISA, 2013) –which might exceed, still in 2020, the sharp increase in deforestation rates observed in 2019 (IPAM, 2019; INPE, 2019; MAPBIOMAS, 2020). IT requires a comprehensive approach bringing together transparency, accountability, and integrity, comprehensively including the participation of all in the establishment of negotiated solutions to the growing environmental challenges, all interconnected with causes of corruption (UNODC, 2018).

4 CONSIDERATIONS

To achieve equity, fairness, and compliance under challenging international climate and environmental settings (FERREIRA COSTA, 2016), Brazil still must integrate smaller and less powerful actors in the decision-making process (NEPSTAD *et al.*, 2014; MICOLLIS *et al.*, 2014). The country, also, needs to maintain open space to add more prominent players who have not joined environmental initiatives so far –and those who have more influence on the drivers of deforestation (BARRETO and ARAÚJO, 2012; BOUCHER *et al.*, 2013; WHATELY and CAMPANILI, 2014; DA COSTA and FLEURY, 2015; DONOFRIO *et al.*, 2017). In this regard, the value of the above-mentioned multi-stakeholder partnerships and agricultural commodity moratoria (MPF-PA, 2009; MPF-MT, 2010; RUDORFF *et al.*, 2011; CHAKRAVARTY *et al.*, 2012; ABRANCHES, 2015; BANDEIRA, 2015; GIBBS *et al.*, 2015; PIKETTY *et al.*, 2015; ABIOVE, 2016; 2019; PMV, 2017; 2018; ABRAPALMA, 2018). Laid in promoting efficient and sustained coordination among the various international, national, and local policies, actions, and initiatives in Brazil between 2011-12 and 2017-18 (PMV, 2017; 2018). The PMV developed a framework that helped the involved actors maintain their cohesiveness through public and private sustainable agricultural productive agreements, positively impacting deforestation rates despite intense political and economic pressures to maintain business-as-usual agricultural practices. The PMV also adequately supported the implementation of CAR, with a definite impact on land regularization, and reduction of environmental and land degradation in the participant municipalities in the Amazon basin (PMV, 2018). Moreover, different policies, technological innovation, and industry actions came into play, noting that the design and implementation of more sustainable value chains are possible. These agglutinations reinforce the value of local-level concerns, by bringing together stakeholders, re-establishing sustainable management of natural resource and land-use management pacts by the provision of technical assistance, financial support, land regulation and the adoption of more sustainable production techniques, securing land tenure, and guiding local, national and regional environmental legal frameworks.

These multi-stakeholder partnerships helped to fulfill national voluntary environmental and climate agreements addressing supply-chain commitments on reducing deforestation in the investigated period. It has also acted as a promising governance intervention and a complementary tool to implement broader national policy perspectives that align international, national, and sub-national initiatives. It highlights the growing importance of sustainability governance (in enhancing sustainable development by advancing the capacity, efficiency, and effectiveness of multi-stakeholder partnerships in agricultural-forest frontier (BECKER, 2001; PACHECO, 2012; GARDNER and GODAR, 2014). However, despite its successes, the PMV does not represent a cure-all solution for enhancing sustainability and reducing deforestation associated with the soybean and cattle supply chain in these agricultural-forest frontiers. What we know for sure –as a valuable set of characteristics –is that it worked efficiently as a functional funnel systematizing and supporting policy implementation and on-the-ground work driven by federal and state legal frameworks, aligning market forces, while reinforcing substantial decentralization of decisive decision-making processes (FERREIRA COSTA, 2020). It also empowered multi-stakeholder engagements that are now under threat of demobilization due to the dismantling of environmental inspection bodies and the weakening of command and control policies.

Considering the ongoing setbacks in the environmental sector in Brazil, and the complex international political and institutional momentum, to efficiently support agricultural commodity supply chain and deforestation-free commitments, interested actors must go further and align a broader public and private set of interest with a more comprehensive interpretation of sustainability (BECKER, 2001; PACHECO, 2012; GARDNER and GODAR, 2014; UNODC, 2018). Actor-tailored initiatives and strategies must be a priority to promote equitable and fair land-use and sustainability while maintaining stability in the face of political and market oscillations, avoiding the loosening of the enacting policy and technical background that created the conditions for the temporary impairment of drivers of deforestation in the Brazilian Amazon (MICOLLIS *et al.*, 2014; NEPSTAD *et al.*, 2014; FERREIRA COSTA, 2020).

In this regard, the ongoing efforts of maintaining economic growth and agricultural production, and at the same time, preserving the forest and natural resources in agricultural-forest frontiers (BECKER, 2001; PACHECO, 2012; GARDNER and GODAR, 2014), represent a real challenge in the new multilateral order appearing in the 21st century for emerging economies (FERREIRA COSTA, 2016). Sub-national governments and communities around the world should build upon this challenge to promote and expand opportunities to enhance agricultural supply chain sustainability and prevent deforestation by scaling up improved environmental management and environmental compliance at the local level to impact global environmental outcomes under the 2030 Agenda of development and national priorities.

4.1 The bottlenecks

Corruption, criminal activities, unsustainable commercial, and land-grabbing-related practices are increasing concerns in the Amazon basin (UNODC, 2018). Although the PMV put proper mechanisms to mainstream, measure, and monitor its progress, significant gaps still exist in terms of participation, and political will to address the clandestine nature of environmental degradation. Apart from some setbacks considering the demand for solutions on where and how we can produce and protect. The Rural Producers' Union of the Municipalities is part of the PMV's Executive Committee, while smallholder farmers still lack adequate representation. To date, deforestation policies and actions under these multi-stakeholder partnerships and agricultural commodity moratoria have focused on larger producers and properties located in hot spots of deforestation instead of display efforts to integrate smallholder farmers and traditional communities, and include areas beyond the agricultural-forest frontier (BECKER, 2001; PACHECO, 2012; GARDNER and GODAR, 2014; MICOLLIS *et al.*, 2014; NEPSTAD *et al.*, 2014) –possible future hot spots of socioeconomic and political activities (as potential targets of policies and actions). Another important aspect is that deforestation rates have been declining over the years in many municipalities because there was not much forest left to cut, putting escalating pressure on protected areas. High levels of environmental degradation, widespread poverty, and wealth concentration, combined with unsustainable economic activity and environmental and political pressure, have worked to deplete natural resources in the region massively (IPAM, 2019; INPE, 2019; MAPBIOMAS, 2020).

There is still room to increase the effectiveness of actor-tailored measures to promote land-use sustainability and avoid future environmental damage and restore what was lost. It demands the development of an adaptive approach to consider deforestation associated not only

with traditional players but with less visible actors and new agricultural expansion frontiers (NEPSTAD *et al.*, 2014; MICOLLIS *et al.*, 2014; GARDNER and GODAR, 2014; FERREIRA COSTA, 2020). Besides, political pressures to relax the environmental legislation, and to dismantle control bodies and institutions –in practice, reducing transparency and accountability –highlights complexities and uncertainties, creating the environment where risks of corruption, land grabbing, and agricultural and environmental malpractices are even more prevalent (UNODC, 2018).

Historically, actors thrived in an environment where low risks of punishment and high rewards regarding environmental degradation, deforestation, and corrupt behaviors (land grabbing and modern forms of slavery, for instance), were rationalized and justified on social norms and beliefs and attitudes. Pervasive incentives to engage in such acts remain crucial, reinforced by power asymmetries between individuals, groups, and organizations that give discretionary power to larger actors in pursuing self-interests and engaging in environmental degradation and corruption. Often correlated with bureaucracy and oversight of accountability arrangements; and, mostly related to socioeconomic inequality and widespread poverty in rural communities in the Brazilian Amazon. These elements represent a complex phenomenon manifested throughout history and the territory, with profound implications on the levels of human development and environmental sustainability (BECKER, 2001; GUIMARÃES *et al.*, 2011; BARRETO and ARAÚJO, 2012; PACHECO, 2012; VIANA *et al.*, 2012; WHATELY and CAMPANILI, 2014; GARDNER and GODAR, 2014; MICOLLIS *et al.*, 2014; NEPSTAD *et al.*, 2014; ALVES-PINTO *et al.*, 2015; PIKETTY *et al.*, 2015; PMV, 2017; 2018; FERREIRA COSTA, 2016; 2020).

Multi-stakeholder partnerships can help alleviate environmental pressure, meet the rising demand for agricultural commodities production and natural resources management, and protect and restore natural ecosystems to maintain access to resources while avoiding federal, state, and market punishments. In the aspects of anti-corruption measures, they can help clarify laws and regulations governing the public sector, defining priorities and limiting abuse of power. Also, by strengthened institutions, separating public and private spheres, promoting rights-based relationships; implementing checks and balances, reduce opportunities to stakeholders engage in corruption; and finally, reinforcing transparency, accountability, and integrity mutually –by the application of generally accepted values and norms in daily practice –, providing timely and reliable information on decisions and performance to tackle corruption in its many forms, more effectively (MPF-PA, 2009; MPF-MT, 2010; RUDORFF *et al.*, 2011; BARRETO and ARAÚJO, 2012; CHAKRAVARTY *et al.*, 2012; BOUCHER *et al.*, 2013; WHATELY and CAMPANILI, 2014; ABRANCHES, 2015; BANDEIRA, 2015; DA COSTA and FLEURY, 2015; PIKETTY *et al.*, 2015; GIBBS *et al.*, 2015; ABIOVE, 2016; 2019; FERREIRA COSTA, 2016; 2016a; 2020; PMV, 2017; 2018; DONOFRIO *et al.*, 2017; ABRA-PALMA, 2018; UNODC, 2018).

4.2 Challenges: Political Instability and Anti-Corruption Approaches

Historically, international and national communities had addressed the environmental, economic, and social dimensions of land-use and forest conservation and preservation separately (BAYRAK and MARAFA, 2016). The 2030 Agenda, built upon the traditional call of the Brundtland Report (UN, 1987) –highlighting the three dimensions of sustainable deve-

development: environmental protection, economic growth, and social equity –adding two critical and innovative dimensions: partnerships and peace; composed of five pillars, or “5Ps”: people, planet, prosperity, partnerships, and peace; revolutionizing our understanding of how to build inclusive societies, based on a spirit of strengthened global solidarity by drawing the principles of leaving no one behind, universality, multi-stakeholder partnerships, interconnectedness and indivisibility, and inclusiveness (A/RES/70/1 –UN, 2015). In this regard, and according to Nepstad *et al.* (2014), punitive measures should be complemented with positive incentives and finance at scale for all actors to allow a sustainable transition to achieve lower deforestation rates, greenhouse gas emissions (GHG) reductions, productive inclusion, and sustainable rural development (GRABOWSKI and CHAZDON, 2012; FGV/EASESP, 2018; FAZENDA, 2020; PMR Brazil, 2020). Within this perspective, indigenous areas and areas under other forms of legal protection are still under intense political and economic pressure (PMV, 2018). Therefore, actor-tailored actions should target these elements with a more inclusive lens. The many multi-stakeholder partnerships have failed to manage these issues properly (MICOLLIS *et al.*, 2014; NEPSTAD *et al.*, 2014; FERREIRA COSTA, 2020). There are excellent opportunities for improvement in this area, such as the deployment of programs to reforest and restore degraded land and secure the conservation of protected areas that integrate local communities, and initiatives related to carbon pricing and carbon markets under development (FGV/EASESP, 2018; FAZENDA, 2020; PMR Brazil, 2020).

Against it all, the risks imposed by conservative national and sub-national political forces and historical patterns of exploiting the environment pose medium- to long-term risks and challenges. They are reflections of historical patterns that proved unreliable to promote sustainable development and adaptation in the Amazon Basin. In this context, the United Nations Convention Against Corruption (UNCAC) recognized that international cooperation, including enhancing enforcement and preventive measures, is crucial for achieving common goals of good governance and sustainable development, helping maintain lasting multi-stakeholder partnerships (UNDP, 2015; UNODC, 2018).

In the Amazon, political forces commonly foresaw the loosening of environmental legislation as an alternative to supporting economic expansion at the expense of the environment and the people of the forest. Current setbacks on the political decision-making processes interfering with environmental sustainability, deforestation, and land degradation with ongoing supply chain deforestation-free commitments are already evident (IPAM, 2019; INPE, 2019; MAPBIOMAS, 2020). Simultaneously, political decisions facilitate deforestation and degradation under the justification of solving economic problems in the region and nationwide.

Thus, market and political interactions must provide higher transparency, accountability, fairness, and anti-corruption efforts (UNODC, 2018). The pressuring context of deforestation represented by the need to maintain agricultural growth and commodity production in agricultural-forest frontiers (BECKER, 2001; PACHECO, 2012; GARDNER and GODAR, 2014), face even more constant pressure and intensification now, and for years to come in the Brazilian Amazon.

4.3 Limitations of this Research and Additional Studies

Despite multi-stakeholder initiatives influencing agricultural economics and business in Brazil, deforestation, land degradation, and land grabbing remain a complex development

challenge. Although, we presented multi-stakeholder partnerships and initiatives influencing economics and business in Brazil. This subject demands more studies to clarify if or how actors could get a better price for, or be allowed to export, soybean, beef or oil palm –an emerging environmental danger in the Amazon basin (LEVITT and ARAÚJO, 2017; ABRA-PALMA, 2018) –from illegally deforested areas. We need to clarify how the initiatives mentioned above effectively helped create new and better jobs, while also contributing to improving income levels, avoiding work in conditions analogous to modern slavery, and ultimately reducing poverty rates and environmental degradation. Moreover, we could benefit from additional studies in various aspects of the multi-stakeholder partnerships and agricultural commodity moratoria as enablers, at the sub-national level, of what we could call “good policy” against the ongoing environmental policy and institutional dismantling. Therefore, limitations identified are a promising opportunity for additional research –investigations contributing to the understanding of the area of activity of several industries (from beef to soy, and palm oil), such as the buying and selling of livestock, addressing their productive dynamics that go beyond the limits of the municipalities, but that take place in those contexts.

5 CONCLUSIONS

Under the Agenda 2030, the Paris Agreement, the NDCs, and the 2014 New York Declaration on Forests (NYDF) countries must be transparent about how and what they do to tackle multi-stakeholder partnerships challenges. In this regard, sustainable agricultural commodity supply chain and deforestation-free commitments ensuring social protection, human development, and economic growth are of extreme relevance for Brazil. To address current challenges further, transparency, accountability, integrity, and anti-corruption efforts regarding land-use change and forest conservation, including bold and aggressive GHG reduction emissions targets, more profound climate change adaptation and mitigation measures, and new channels for financial support is needed. Moreover, strengthening institutions and communities and facilitating access to information will represent (not only) valuable aspirations, but a necessary condition for reducing deforestation and establishing more sustainable agricultural supply chains.

The investigated multi-stakeholder partnerships and agricultural commodity moratoria played a vital role as local level ‘enablers’ for the entire environmental governance structure related to agricultural commodity supply chain and deforestation-free commitments in the Brazilian Amazon between 2011-12 and 2017-18. These local level initiatives should not be seen in isolation, as they share strong linkages with international and national policies and decision-making processes. They responded to a critical gap identified by many stakeholders over the last two decades of environmental and climate policy implementation in the Brazilian Amazon, namely, the absence of explicit recognition of the critical importance of local governance and local-level institution-building as an underpinning sustainable development approach to land-use change and forest conservation efforts, which was pursued through increasing decentralization. Moreover, many Stakeholders engaged in promoting cooperative, durable arrangements for environmental conservation and social cohesion. Gaining access to financial resources, training, land regularization, and in building capable, accountable, and participative institutions at the local level, supported anti-corruption efforts by strengthening institutions, enhancing public services, securing resources that helped to mitigate climate change, bringing

transparency, accountability, and integrity in the agricultural-forest frontier of the Brazilian Amazon. Further, the collective responses of authorities, the private sector, non-state actors, and civil society, could expedite advancements in the fight against deforestation and build of more climate-resilient communities leading to profound economic transformation and better resource allocation at significant scales. However, due to recent setbacks in of command and control policy and means of environmental policy implementation, Brazil has seen a tremendous increase in its deforestation rates, along with a temporary increase in its agricultural production, despite negative repercussion on rural income levels and international public reputation and image, at the same time the Amazon, and other biomes in Brazil, remain under the threat of an even more significant increase in deforestation rates.

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ABBREVIATIONS

BNDES –Banco Nacional de Desenvolvimento Econômico e Social/Brazilian National Bank for Economic and Social Development

BRL –Brazilian Currency (Real)

BUR –Biennial Update Report

CAR –Cadastro Ambiental Rural Rural Environmental Registry

CDL –Critical Deforestation List

LAR –Rural Licensing Registry

LDI –Lista de Desmatamento Ilegal/ List of Illegal Deforestation

FIP Amazônia –Fundo de Investimentos em Participações Multiestratégia em Empresas Sustentáveis na Amazônia/Multi-strategy Equity Investment Fund in Sustainable Companies in the Amazon

FREL –Forest Reference Emission Levels

IBAMA –Brazilian Institute for the Environment and Renewable Natural Resources

ICMS –Imposto sobre Circulação de Mercadorias e Serviços/ Tax on the Circulation of Goods and Services

IDESP –Social and Environmental Development of the State of Pará

INPE –National Institute for Space Research

ISA –Environmental Social Institute

MMA –Ministry of Environment of Brazil

MDA –Ministry of Agrarian Development of Brazil

MPF –Federal Prosecution Service of Brazil/Ministério Público Federal

NDC –Nationally Determined Contribution

NYDF –New York Declaration on Forests

PMV –Programa Municípios Verdes/Green Municipalities Program

PRODES –Programa de Monitoramento do Desmatamento da Floresta Amazônica Brasileira por Satélite/Satellite Deforestation Monitoring Program of the Brazilian Amazon Forest

REDD+ –Reducing Emissions from Deforestation and Forest Degradation

TAC –Terms of Adjustment of Conduct

TNC –The Nature Conservancy

UNCS –UN Climate Summit

UNFCCC –United Nations Framework Convention on Climate Change