



Nuevos Mecanismos de Gobernanza que incorporan las políticas nacionales de adaptación y mitigación al cambio climático en el nivel local en la Amazonia brasileña

New Governance Mechanisms Mainstreaming National Climate Change Adaptation and Mitigation Policies into the Local Level in the Brazilian Amazon

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ABSTRACT

Research in the field of Global Environmental Governance (GEG) pays considerable attention to the emergence of New Governance Mechanisms (NGM). NGM poses profound challenges to governments and institutions in the Developed and Developing world alike, corresponding to new ways of participation. This article seeks to contribute to the debates on NGM by analyzing a municipal-level environmental governance scheme based on deforestation-free commitments emerged in 2011 in Brazil, that has successfully helped to reduce deforestation in the participant municipalities; the Green Municipalities Program (PMV). We also shed some lights on the risks represented by promises of changes in federal environmental legislation by the newly elected government of Brazil. It is secondary research based on official data analysis that provided a cost-effective way of gaining a broad understanding of the mainstreaming of National and State climate change mitigation and adaptation policies into the local level, as well as a report of the governance of policy instruments in NGMs. Methodologically we rely on the method of data and text analysis, based on the study of the PMV Statistical Database, which gives visibility to a broad range of environmental, social, and territorial data and information for the 144 municipalities of the Pará State, through six different types of official reports.

KEYWORDS

Amazon Biome; Sustainable Development Pathways; Climate Governance; Deforestation-Free Commitments; Policy Instruments; Green Municipalities Program.

RESUMEN

La investigación en el campo de la gobernanza ambiental global (GEG) presta una atención considerable a la aparición de Nuevos Mecanismos de Gobernanza (NMG). NMGs plantean desafíos profundos a

los gobiernos e instituciones en el mundo Desarrollado y en Desarrollo por igual, correspondientes a nuevas formas de participación. Este artículo busca contribuir a los debates sobre NMGs mediante el análisis de un esquema de Gobernanza ambiental a nivel municipal basado en compromisos libres de deforestación surgido en 2011 en Brasil, que ha ayudado con éxito a reducir la deforestación en los municipios participantes; El Programa Municipios Verdes (PMV). También arrojamamos algunas luces sobre los riesgos representados por las promesas de cambios en la legislación ambiental federal por parte del nuevo gobierno electo de Brasil. Es una investigación secundaria basada en el análisis de datos oficiales que brindó una manera rentable de obtener una comprensión amplia de la integración de las políticas de mitigación y adaptación al cambio climático en varios niveles y en el nivel local, así como un informe de la gobernanza de los instrumentos de política en NMGs. Metodológicamente, nos basamos en el método de análisis de datos y texto, basado en el estudio de la base de datos estadísticos del PMV, que da visibilidad a una amplia gama de datos e información ambiental, social y territorial de los 144 municipios del estado de Pará, a través de seis tipos diferentes de informes oficiales.

PALABRA CLAVE

Bioma Amazónico; Caminos de Desarrollo Sostenible; Gobernanza Climática; Compromisos Libres de Deforestación; Instrumentos de Política; Programa Municipios Verdes.

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1. INTRODUCTION¹

Climate change, along with inequality, is one of the most significant moral and environmental issues of our time. A viable way to combat climate-related risks requires all –Developed and Developing nations, and the rich and the poor peoples alike, to limit their greenhouse gas (GHG) emissions to what might be considered a «fair share» of safe global emissions². In turn, it will demand the highest attention to the moral imperatives of climate change based on the fact that all of 197 Parties have agreed to adopt policies and measures –through «Nationally Determined Contributions (NDCs)»– to prevent «dangerous anthropocentric interference with the climate system» under the United Nations Framework Convention on Climate Change (UNFCCC) (UNFCCC, 1992: Art. 2; UNFCCC, 2019). As of March 2019, 185 Parties have ratified the Paris Agreement, which entered into force on 4 November 2016 (UNFCCC, 2019; UNTC, 2019). To date, the United States of America is the only Party expressing intention of exercise its right to withdraw from the Paris Agreement, as soon as it is eligible to do so under the Agreement (UNFCCC, 2017).

In accordance with Article 4, paragraph 12 of the Paris Agreement, NDCs are at the heart of the Paris Agreement and the achievement of these long-term goals. In this regard, 182 Parties have submitted their first NDCs, and 1 Party has submitted their second NDCs (UNFCCC, 2019a).

As the demands for agricultural production continue to grow, and the restrictions on where and how we can produce and protect become equally more prevalent, the comprehension of climate actions related to deforestation goes beyond a mere description of a vital environmental issue, we must review its concepts under a perspective of imbalance in power relations. For this reason, our approach focus on the analysis of innovative forest governance schemes as a manner to shed some light on the search for solutions to the current political and environmental challenging panorama.

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² UNFCCC. Paris Agreement - Status of Ratification. Brazil currently commits to reduce greenhouse gas emissions by 37% below 2005 levels in 2025. Subsequent indicative contribution: reduce greenhouse gas emissions by 43% below 2005 levels in 2030 (NDC, 2015).

Assuming that Brazil has been doing its best to fulfill its voluntary commitments to reduce GHG emissions³, and taking into consideration the current profile⁴ of the Brazilian GHG Emissions (MCTIC, 2016; SIRENE/MCTIC, 2017). We aim to further encompass some contribution on this matter by addressing the potential contribution of a local governance scheme created in 2011 in the State of Pará, Brazil: the Green Municipalities Program (Programa Municípios Verdes-PMV). Inspired by the pioneering experience of the municipality of Paragominas, the government of the State of Pará launched the Green Municipalities Programme (PMV) in 2011⁵, aiming to drastically reduce deforestation and change the basis of the state rural economy –largely extensive and predatory (IMAZON, 2018). Several authors have described the PMV (Guimarães et al., 2011; Viana et al., 2012, and; Miccolis et al., 2014) as an innovative forest governance scheme supporting productive deforestation-free commitments.

Brazil is a Federative Republic composed of municipalities (local sphere), states (regional sphere), and federal (national sphere). The PMV works at the municipal level, and has successfully helped the local implementation of a set of State and Federal policies and actions in the territory that reduced deforestation and land degradation in the participant municipalities⁶.

In this regard, Brazil has numerous programs and initiatives⁷ to promote the reduction of deforestation and forest degradation, conservation, sustainable forest management and forest restoration (REDD+⁸ activities). The complementarity and consistency of these actions occur in the Amazon biome through the PPCDAm⁹. The PPCDAm¹⁰ aims to coordinate and direct the different policies and initiatives identified as linked to the dynamics of deforestation and climate action¹¹ (IPEA/GIZ/CEPAL, 2007; MMA, 2018; PPCDAm, 2004; PPCDAm, 2009; PPCDAm, 2013; MMA, 2016; MMA, 2016b, GTPI, 2016).

2. METHODOLOGY

The paper presents secondary research based on the official PMV Statistical and Territorial Database, and relevant national environmental and climate legislation analysis that we believe provide a cost-effective

³ Brazil plays an important and unique role in climate change. It is one of the ten largest economies in the world and –most importantly for climate change– home to one of the greatest ecosystems and forests of the planet: the Amazon. Brazil is the eighth largest emitter of greenhouse gases, and the third largest emitter in the developing world after China and India, according to 2000 World Resources Institute figures. Unlike most developed and many developing countries, Brazil's energy sector contributes little to the country's greenhouse gas emissions. Unsustainable land use and forestry contribute most.

⁴ In 2015, Brazil's total emissions were 1,368 billion tons of CO₂e (GWP-AR2). The peak of Brazilian emissions occurred in 2004, when 3,453 billion tons of CO₂e were released into the atmosphere, mainly due to the high rates of illegal deforestation of that year, but we observed that between 2005 and 2017, the decline in deforestation rate Amazonia was 65%. This reduction, achieved in large part through the implementation of the Action Plan for Prevention and Control of Deforestation in the Legal Amazon (PPCDAm), significantly altered the Brazilian profile of greenhouse gas emissions. SIRENE/MCTIC (2017).

⁵ Through the Pará State Decree No. 54/2011.

⁶ Overall deforestation reduction in the Amazon biome ranged from 5,679.90 km² (2008) to 2,744.30 km² (2016). Lowest deforestation rate obtained in 2014 (1,784.10 km²). Programa de Cálculo do Desflorestamento da Amazônia (Program for the Calculation of Amazon Deforestation). PRODES (2018).

⁷ These include: the Federal Constitution, Native Vegetation Protection Law (New Forestry Code), National Policy on Environmental Management in Indigenous Lands, Federal Public Forest Management Law, National Environmental Policy, National Policy on Climate Change, Program of Amazonian Protected Areas, Ecological and Economic Macrozonning, Rural Environmental Cadastre, National Biodiversity Policy, Amazonian Degraded Areas Recovery Program, National Community and Family Forest Management Program, National Agrarian Reform Program, Brazil Quilombola Program, United Nations Convention on the Rights of Indigenous Peoples, Convention 169, Convention on Biological Diversity, Ramsar Convention, Agenda 21, National Policy on Water Resources, among others.

⁸ Reducing Emissions from Deforestation and Forest Degradation, as well as conservation, sustainable management of forests and enhancement of forest carbon stocks.

⁹ Plano de Ação para Prevenção e Controle do Desmatamento na Amazônia Legal (Action Plan for the Prevention and Control of Deforestation in the Legal Amazon); It is a governmental action arrangement, launched in 2004, as a governmental response to the increasing rates of deforestation in the Amazon, with the objective of promoting the reduction of deforestation rates; whose results contributed significantly to the decline in deforestation, for example, achieving a reduction of 71% in the deforestation rate between 2005-2016 period.

¹⁰ It is currently in its 4th phase: (i) PPCDAM - 1st phase (2004 to 2008); (ii) PPCDAM - 2nd phase (2009 to 2011); (iii) PPCDAM - 3rd phase (2012-2015); and, (iv) PPCDAM - 4th phase (2016) - Operational Plan 2016-2020. The activities carried out are included in the axes: (i) Land and Territorial Planning; (ii) Environmental Monitoring and Control; and (iii) Promotion of Sustainable Productive Activities; and, (iv) Economic, Fiscal, and Tax Standards and Instruments.

¹¹ With regard to the National Policy on Climate Change (PNMC), the PPCDAm is one of the instruments by which the Brazilian government contributes to the fulfillment of its voluntary national commitment to reduce its greenhouse gas emissions, with the contribution of other sectoral mitigation and adaptation to climate change.

way of gaining a broad understanding of current research questions embracing different aspects of sustainability in the Amazon Basin. We base our analysis on the integration of multi-level climate change mitigation and adaptation policies, to analyze the governance of policy instruments in PMV. Methodologically we rely on the method of data and text analysis as an essential approach comparing data and information from different sources gathered in the PMV Statistical and Territorial Database, that gives visibility to a broad range of environmental, social, and territorial data focusing on the information for the 144 municipalities of the Pará State, through six different types of official reports. This research bases its discussion on the «comparatives» found in specific reports, concerning: CAR¹², Deforestation rates, Environmental Management, Adhesion to the PMV, and the Signing of Pacts to reduce deforestation made public by the Brazilian Law on Access to Information¹³.

The PMV statistical database offers comparative territorial data and information from government sources such as PRODES¹⁴, INPE¹⁵, the municipalities, among others. At the current stage of this research, we focused on specific environmental policies and initiatives targeting the Amazon basin¹⁶. Our research approach defends that the use of normative background is useful to provide an overview of local environmental governance mechanisms potentiality (as well as their limitations) to contribute further to Brazil's GHG emissions reductions¹⁷, considering its ability to control and reduce deforestation at the local level. We pay considerable attention to the emergence of the PMV as a result of political consensus, and sound environmental criteria agreed in Brazil, as well as a response to National and International Climate Negotiations, combined with market pressure putting Brazil in the route to elaborate a robust set of national and state climate policies and actions, implemented through a strong climate governance framework¹⁸ that influenced local governments and civil society (NPCC, 2007). Brazil experienced the emergence of many different innovative environmental governance schemes around the country in recent years, whereas the PMV represents one of the most emblematic opportunities for transformational change at the local level. Modern sustainable forest management standards started to be effectively implemented replacing previous economic and social patterns based on the degradation of the environment, livelihoods, and natural resources. In this sense, this research seeks to advance the debates about the GEG by analyzing the NGMs that contribute to integrate national and state policies for adaptation and mitigation of climate change at the local level. We focus our attention on a sole environmental governance scheme –The PMV. Since the PMV has established a well-structured framework to support deforestation-free commitments at the local level¹⁹ (originally induced by Federal policies and programs).

We aim to shed some light on how this environmental governance scheme emerged due to the application of federal environmental legislation, and its correlated climate governance framework, as a tool to integrate climate change adaptation and mitigation national policies and programs at the local level in the Brazilian Amazon. We, also, briefly discuss how the promises of weakening the environmental legislation made by the newly elected government of Brazil can affect this governance mechanism.

Issues relating to climate change, sustainability, and biodiversity are relevant, and this discussion should encourage integrated local participation. We wonder if such governance mechanism could be affected by the expected political changes arising in the new government. How local environmental governance mechanisms

¹² Cadastro Ambiental Rural (Rural Environmental Registry).

¹³ Law No. 12,527/2011.

¹⁴ Programa de Cálculo do Desflorestamento da Amazônia (Program for the Calculation of Amazon Deforestation) –PRODES and other deforestation monitoring systems (Deter, Degrad, TerraClass), coordinated by the General Coordination of Earth Observations of the National Institute of Space Research (INPE). It conducts satellite monitoring of shallow deforestation in the Legal Amazon area in Brazil, and has been producing annual deforestation rates in the region since 1988, which are used by the Brazilian government for the establishment of public policies. The annual rates are estimated from the deforestation increments identified in each satellite image that covers the Legal Brazilian Amazon area.

¹⁵ Instituto Nacional de Pesquisas Espaciais (National Institute of Space Research).

¹⁶ The following set of regulations and standards subsidize the policies and initiatives that allowed the emergence of the PMV: Federal Decree 6,321/2007; MMA Ministerial Ordinance 28/2008; MMA Ministerial Ordinance 102/2009; MMA Ministerial Ordinance 138/2011; Bacen Resolution 3,545/2008; Decision of the National Monetary Council on the CCIR to access credit; MMA Normative Instruction 01/2008; Decree of the State of Pará 54/2011.

¹⁷ Brazil has mitigation contributions for the years 2020, 2025 and 2030, present in Law No. 12,187/2009, which establishes the National Policy on Climate Change (PNMC); in Decree No. 7,390/2010, which regulates PNMC; and the Nationally Determined Contribution (CND or NDC) of Brazil, under the Paris Agreement. It is worth noting that Brazil was one of the few developing countries to report to the Convention on Climate Change (UNFCCC) a mitigation modality based on absolute reduction of GHG gas emissions.

¹⁸ Interministerial Committee on Climate Change Created by Decree No. 6,263, November 21, 2007.

¹⁹ Brazil refused to join the international pact to end deforestation by 2030. However, it has developed its own framework to halt deforestation and land degradation.

adhere to (if they will adhere), and how they respond to political changes, is still open for discussion and analysis.

3. RESULTS AND DISCUSSION

3.1. The way(s) to achieve sustainable governance

In the Anthropocene²⁰ (Walter et al., 2016), governance is based on shared expectations, as well as on intentionally designed institutions and mechanisms. However, governance is at the same time a permissive concept –like globalization– in the sense that it gives one license to speak or write about many different things, from any pattern of order or deviation, from anarchy –which also has multiple meanings– to normative preferences about how people should organize and understand the world (Rosenau and Czempiel, 1992; Biersteker, 2009).

We foresee that normative approaches are critical to support strong critical thinking while giving us the basis for reliable conclusions. This approach gives us limits and boundaries (mostly because environmental issues demand discussion to reach consensus), but also because as in the case of Brazil, advanced environmental norms and laws strongly regulate environmental issues.

Our approach entails an objective perspective for current and future analysis, by seeking to establish clear rules on (i) how environmental goals can be established and maintained; (ii) how they can be adapted to achieve previously established goals exposed to a dynamic reality; and finally, (iii) how the political outcomes produced can be shaped in a way that positively re-fuels the advancement of policies and actions. Thus, under this perspective, we seek to reinforce the provision of solutions to the complex problems of environmental deterioration and human well-being in the field of natural resource management. We also adopted the belief that a system of rules and norms that extend from the global to the local level has been used to provide a basis for forest governance in the country. It has defined, constrained, and shaped actors' expectations in different domains (Ostrom, 2005; Biersteker, 2009: 180). How it could work from the local to the global is still an open and promising field of research.

Nonetheless, our approach is consistent with observations of Arid Vatn and Paul Vedeld (2011). They stated that two main elements are fundamental to governance: (i) the type of actors involved, characterized by their capacities and competencies; and, (ii) the (formal and informal) institutions that facilitate the interaction and the coordination between them, and the different levels of actors (playing a fundamental role in this process). In this sense, environmental governance demands continuing policy-making at national and subnational levels, but also, accountability.

Granted that «global governance of the environment» is not limited to «governance that is global» (Overbeek et al., 2010; Latham, 2009). It is instead concerned with political power –as a basic concept– at all levels of the political system. To the best understanding of environmental governance, the analysis of how state and non-state actors actively shape policy actions and outcomes is inevitable (Biermann et al., 2010; Schroeder, 2010: 320). Global norm-setting requires local decision-making and implementation (Pattberg and Widerberg, 2014: 688; 696), once actors' actions are not merely the result of functional gaps being filled in the governance structure, but they are –at least, partially– the result of political motives, oriented and constructed under normative directives.

3.2. The momentum that led to the emergence of innovative forest governance mechanisms in Brazil

The three branches of government in Brazil have historically issued a series of decrees and norms aimed at combating deforestation in the Amazon basin²¹. These actions were commonly based on the restriction of

²⁰ The «Anthropocene» is an officially distinguishing new human-dominated time period, as Humans are undoubtedly altering many geological processes on Earth –and have been for some time. It describes climatic, biological, and geochemical signatures of human activity in sediments and ice cores, combined with deposits of new materials and radio nuclides, as well as human-caused modification of sedimentary processes. The Anthropocene stands alone stratigraphically as a new epoch beginning sometime in the mid-20th century.

²¹ Often neglecting other biomes such as the Caatinga in the Northeast zone of the country, and only recently including the Cerrado Biome in its main policies –mostly due to international economic pressure. MMA (2018).

credit to activities associated with illegal deforestation. However, the effect of these policies was often expressionless or short, since the market itself had most influenced deforestation rates (Barreto and Araújo, 2012).

However, since the beginning of the 21st century, Brazil has been witnessing a paradigm shift concerning deforestation. According to Maia et al. (2011), and Viana et al. (2012), the increase in farmers' awareness concerning the market forces and their consequences regarding economic gains and losses, as well as command and control policies²², have proved successful in reducing deforestation, by the promotion of change of mentality, and certainty of punishment. Despite the limited effects on the reduction of the environmental degradation in the Amazon Biome, and limited reduction of deforestation in the other Brazilian Biomes, a possible path of sustainability appears to be emerging in the country (MMA, 2018). This new view is based on the quest to evolve beyond merely isolated punitive measures designed to unsuccessfully promote sustainable land use and forest conservation.

During the period 2004²³-2009²⁴, Brazil has experienced the development of a vast set of environmental policies and multi-level actions, including the active participation of the civil society trying to cope with the challenges of reducing deforestation more consistently. This set of policies tried to hold entire value chains accountable for illegal deforestation, especially targeting logging, soybean farming, and cattle ranching; issuing hefty fines and shutting down illegal operations while also setting up a blacklist of perpetrators of deforestation and environmentally unsustainable practices with top-down approaches (MCTIC, 2016; MPF, 2012; MAPA, 2013).

As a result, the Amazon basin witnessed the emergence of several local-level environmental governance schemes –some based on deforestation-free commitments as the PMV–, as a response do federal actions. As a result, the country efforts to promote compliance with international environment and climate negotiations, and the construction of modern social laws, as well as the repositioning of Brazil as a key-actor in global climate negotiations contributed to recently reduced deforestation rates in the Amazon basin.

At the same time that international²⁵ and national discussions²⁶ on climate change, forest conservation, and GHG reduction emissions strongly influenced the strengthening of environmental policies combating deforestation and land degradation in Brazil (MMA, 2016b; SIRENE/MCTIC, 2017; OC, 2018). They have mobilized different actors –mainly the Federal Government, Non-Governmental Organizations (NGO), and large national entrepreneurs against environmental degradation, resulting in the creation of economic and

²² (i) Restriction of Rural Credit –Resolution 3,545, of February 29, 2008, of the National Monetary Council that requires environmental and agrarian regularity to finance agricultural and livestock projects in the Amazon Biome; (ii) List of Municipalities that Deforested in the Amazon and imposition of various administrative restrictions to those municipalities. Procedure under the Federal Decree 6,321/2008, the first list published by the MMA goattending 28 municipalities in January 24, 2008; (iii) List of Embargoed Areas –Publication by the IBAMA of the list of rural properties and owners who received environmental embargoes as a result of deforestation, based in the Article 18, § the 1st, in the Federal Decree 6,514/2008; (iv) Ownership of the meat production chain as a result of the regulations of the Law on Environmental Crimes, who blamed all actors, in the production chain, that would acquire products from embargoed areas, according to Article 54 of the Federal Decree 6,514/2008, and the action of the Federal Prosecution Service of Brazil (MPF) which resulted in the signing of a TAC (Terms of Adjustment of Conduct - Termos de Ajustamento de Conduta) forcing sector companies, in the meatpacking industry, to buy cattle from legalized ranches, according to TerraClass Data (a project developed by Embrapa and INPE); (v) Strengthening control operations that were more effective and consistent, as the apprehension of machines, products (wood, coal, grains) and animals in rural properties with illegal deforestation (e.g.: operation Arc of Fire and Pirate Ox). In addition, Brazil assumed an international commitment at COP-15 (Copenhagen) to reduce deforestation by 80% until 2020, calculated on the average of the years 1996-2005, which corresponds to 19,600 km².

²³ In 2004, the Federal Government launched the Action Plan for Prevention and Control of Deforestation in the Brazilian Legal Amazon (PPCDAm). It consists of a set of policies structured around three objectives: (i) regulating land tenure and zoning land use, (ii) monitoring land conversion; and (iii) incentives for sustainable activities.

²⁴ The Presidency of the Republic launched the Decree 6,321/2008 and MMA Ministerial Ordinance 28/2008, focused on the fight against deforestation on selected municipalities in the Brazilian Amazon. MMA Ministerial Ordinance 103/2009, modified the criteria for exiting the Critical Deforestation List, which became the following: (a) have at least 80% of the territory on private lands monitored through CAR, by georeferencing of properties' boundaries, areas under permanent protection and legal reserves; (b) 2008 deforestation be ≤40km²; and, (c) annual deforestation mean of the years 2007 and 2008 ≤60% of the mean observed in the 2004-2006 period. In addition, the Federal Government gave priority to municipalities that exit the Critical Deforestation List for access to credit and federal programs and projects that aim to incentivize sustainable activities such as forest plantations, agroforestry, and sustainable agriculture and cattle ranching –MMA Ministerial Ordinance 67/2010–, as well as other norms such as, MMA Ministerial Ordinance 102/2009, MMA Ministerial Ordinance 138/2011, and Central Bank - Bacen Resolution No. 3,545/2008.

²⁵ IPCC/AR5 (2014); Conference of the Parties. Twenty-first session; Decision-/CP.20. Lima Call for Climate Action.

²⁶ Plano Setorial de Mitigação e de Adaptação às Mudanças Climáticas para a Consolidação de uma Economia de Baixa Emissão de Carbono na Agricultura (Sectoral Plan for Mitigation and Adaptation to Climate Change for the Consolidation of a Low Carbon Economy in Agriculture) –(Plano ABC). MMA Ministerial Ordinance No. 150. May 10, 2016 –National Plan for Adaptation to Climate Change.

political incentives to reduce deforestation and promote GHG emissions reductions in key sectors (MCTIC, 2016; SIRENE/MCTIC, 2017). Brazil has adopted voluntary commitments and established a robust climate strategy to achieve the national goals to reduce GHG emissions, as initially established in the PNMC, in 2009, evolving towards the establishment of even more ambitious goals, expressed in the Brazilian NDC, in 2015. Besides, the government altered the Forest Code, establishing monitoring and verification mechanisms such as CAR.

Initially, the National Climate Change Policy (NCCP) established under the Federal Law No. 12,187/2009, and by Federal Decree No. 7,390/2010 –replaced by Federal Decree No. 9,578/2018²⁷–, described a voluntary commitment to reduce GHG emissions by 36.1-38.9% compared to projected emissions by 2020 (according to the baseline of 3,236 GtCO_{2e}), towards absolute emissions reductions between 1,168 GtCO_{2e}, and 1,259 GtCO_{2e}. Later, on September 27, 2015, the Brazilian Government submitted to the UNFCCC, its intended NDC to the new agreement under the Convention at the 21st Conference of the Parties (COP21), in Paris. By adopting an economy-wide, absolute mitigation target, Brazil voluntarily agreed to follow an even more stringent modality of contribution, compared to its voluntary actions pre-2020.

The Brazilian contribution became consistent with emission levels of 1.3 GtCO_{2e} (GWP-100; IPCC/AR5, 2014) in 2025, and 1.2 GtCO_{2e}, in 2030 (GWP-100; IPCC/AR5, 2014), respectively corresponding to a reduction of 37% and 43%, based on estimated emission levels of 2.1 GtCO_{2e}, in 2005 (GWP-100; IPCC/AR5, 2014). The new voluntary commitment, represents an additional gross GHG emissions reduction of approximately 19% in 2025, compared to Brazil's previous national voluntary commitment, which aimed to achieve gross GHG reduction emissions of approximately 2 GtCO_{2e}²⁸ in 2020 (ITAMARATY, 2015; GoB, 2015).

Regarding forest conservation, the Federal government established law No. 12,651, of May 25, 2012 –known as the new «Forest Code»–. It provides general norms on the Protection of Native Vegetation, including Areas of Permanent Preservation, Legal Reserve, and Restricted Use; logging, supply of forest raw material, control of the origin of forest products, control and prevention of forest fires, and the forecasting of economic and financial instruments to achieve its objectives; The Forest Code is inserted in the National legal framework and legal instruments that guide and discipline the use of land and the conservation of natural resources in Brazil.

It brought the creation of an important instrument: the CAR²⁹, regulated by Federal Decree No. 9,578/2018, within the scope of the SINIMA System³⁰, and the implementation of State level Environmental Regulation Programs³¹ (MMA, 2016; 2016a; 2016b; 2018; 2018b; 2018c; BRAZIL, 2018; SEMAS, 2018).

3.3. The green municipalities program

The Green Municipalities Program (PMV) is an innovative municipal-level environmental governance mechanism. It has been put into practice national and State provisions that incorporated changes in the Forest Code³², introducing the CAR³³, the LAR³⁴ –Licenciamento Ambiental Rural (Environmental Rural Li-

²⁷ It consolidates normative acts issued by the Federal Executive Branch that dispose of the National Fund on Climate Change, which deals with Federal Law No. 12,114, of December 9, 2009, and the National Policy on Climate Change, dealt with in Federal Law No. 12,187, of December 29, 2009.

²⁸ Value between 1,977 GtCO_{2e} and 2,068 GtCO_{2e}, which represents a reduction between 36.1% and 38.9% below the projected business as usual emissions in 2020, initially established by the Decree 7,390/2010, and currently regulated by Federal Decree No. 9,578/2018 –assuming GWP-100 (IPCC SAR).

²⁹ The CAR was also established as a criterion for priority municipalities with high rates of deforestation belonging to the list given by Decree No. 6,321/2007 and the ordinances issued annually by MMA to be able to leave the list of major deforesters in the Amazon; It also allows the Federal Government and state environmental agencies to know not only the location of each rural property, but also the situation of its environmental suitability.

³⁰ Sistema Nacional de Informações sobre Meio Ambiente (National Information System on the Environment) –One of the main instruments of the National Environmental Policy, provided for in item VII of article 9, of Federal Law No. 6,938/1981.

³¹ It allow states to guide and accompany rural producers in the elaboration and implementation of the necessary actions for the recomposition of areas with environmental liabilities in their rural properties or possessions, whether in Permanent Preservation Areas, Legal Reserves or of Restricted Use.

³² Law No. 12,651/2012.

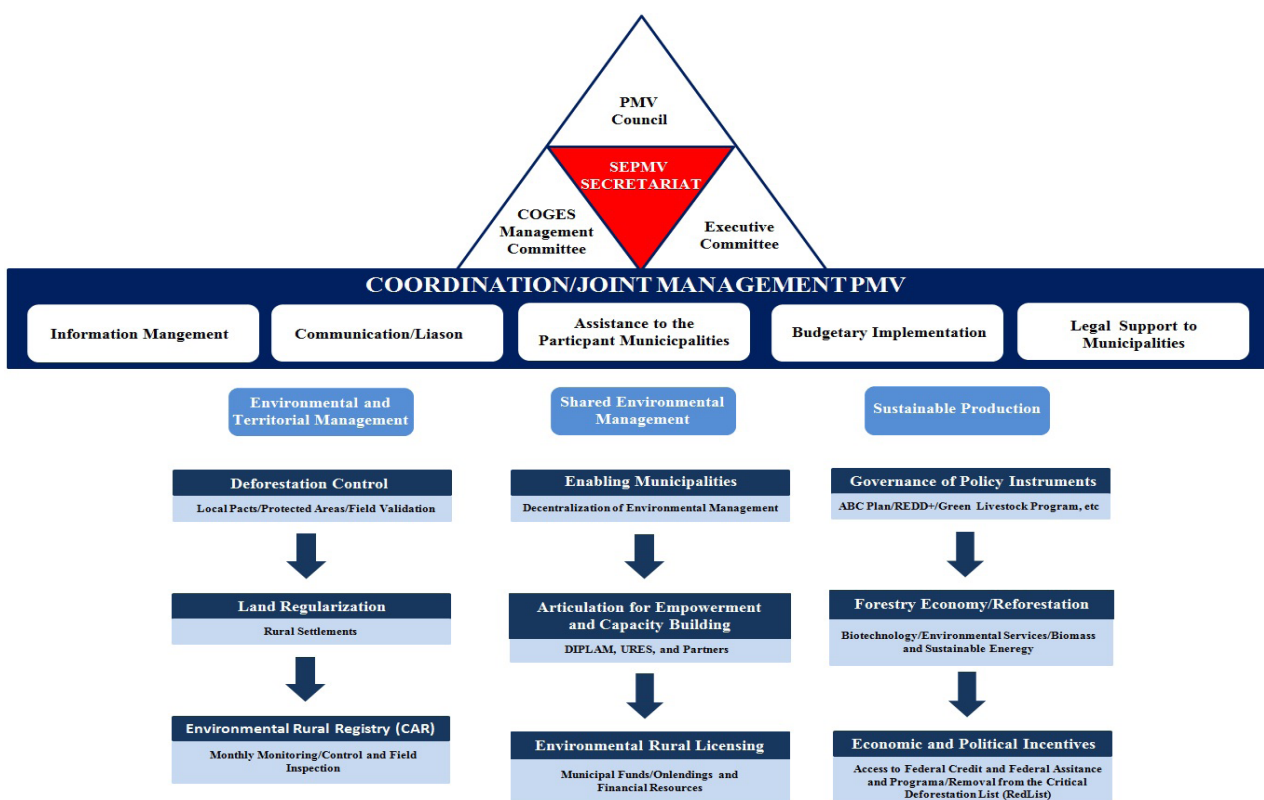
³³ CAR, comprised of an electronic registration system drawing together information on protected areas on private lands as required by law, namely PPAs and LRs, data on forests and native vegetation, as well as human occupation and activities. Rural properties had, initially, until 2015 to be registered in this geo-referenced system, which will be required for issuing any environmental licenses, while also allowing state and federal environmental agencies to compare stated vs. actual land use through satellite images.

³⁴ Ministry of Environment (MMA); IBAMA environmental licensing.

censing) as well as several subsidiary set of policies and programs³⁵, and others initiatives like Bolsa Verde³⁶ (Green Grant). Technically, the PMV is a territorial policy with a significant impact on the legalization of land use. Moreover, it is also a complex policy of command, control, and ordering, implemented and executed through an established pact among the involved actors in the three scales of powers: Federal, State, and Municipal levels (Da Costa and Fleury, 2015).

In 2011, the PMV became a State Government program³⁷ developed in partnership with municipalities, civil society, the private sector, IBAMA³⁸, and the MPF³⁹. It was launched through State Decree N° 54/2011, being coordinated by the Civil House of the Government of Pará, specifically in the figure of the SEPMV⁴⁰. The objective of the PMV is to combat deforestation in the State of Pará, to strengthen sustainable rural production through strategic environmental and land management actions and also environmental management, focusing on local pacts, monitoring deforestation, implementing the CAR, and in structuring the environmental management of the participating municipalities. Figure 1 shows the institutional arrangements and governance framework articulating multi-level environmental policies, programs, and governance schemes.

FIGURE 1. INSTITUTIONAL ARRANGEMENTS AND GOVERNANCE STRUCTURE OF THE PMV



Source: Programa Municípios Verdes (GoP), 2013.

³⁵ Policy measure to prioritize efforts to combat deforestation; CAR; LAR; Certificado de Cadastro de Imóvel Rural (Certificate of Rural Property Registration) –CCIR.

³⁶ Ministry of Environment. Bolsa Verde (Green grant).

³⁷ Dialogue with states has been strengthened since the second phase of the PPCDAm, when the coordinated strategy of the federal and state spheres became more robust with the integration of PPCDAm actions and State Plans. The importance of state action is mainly due to its proximity to local problems and greater ease of articulation with municipalities, where in fact policies are applied.

³⁸ Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (Brazilian Institute of the Environment and Renewable Natural Resources); the administrative arm of the Brazilian Ministry of Environment.

³⁹ Ministério Público Federal (Federal Prosecution Service of Brazil).

⁴⁰ Secretaria Extraordinária para Coordenação do PMV (Extraordinary Secretary for Coordination of the PMV).

The raw origins of the PMV date back to 2006-2008 period⁴¹. The Brazilian government published a Critical Deforestation List⁴², with the inclusion of 17 Pará State municipalities⁴³ in the deforestation list of the Brazilian Ministry of Environment (MMA). The list was a policy measure to prioritize efforts to combat deforestation in critical areas (Viana et al., 2012) –which was later updated to 43 municipalities⁴⁴–, in an attempt to tackle critical levels of deforestation in the Amazon basin. The government action served as an essential input for resource allocation through several environmental policies and programs to combat deforestation at the local level, followed by the signing of Terms of Adjustment of Conduct by the meatpacking industry and livestock producers (IPAM/IMAZON/ISA, 2013; GTS, 2013; GTPS, 2014; GoP, 2015).

The creation of the deforestation list, which included the municipality of Paragominas in the State of Pará, prompted the municipality to develop an innovative environmental concept called «Green Municipality»⁴⁵. The municipal response aimed at getting the municipality off of the blacklist and recover its access to federal credit and assistance⁴⁶, but according to several authors, ended up going much further due its success in combating the historical dynamics of deforestation in that municipality (PARAGOMINAS, 2008; Guimarães et al., 2011; MPF, 2012; MAPA, 2013; GoP, 2015).

The PMV is the result of a participative process enabled through trust-building, by the establishment of partnerships and agreements between NGOs⁴⁷ (The Nature Conservancy-TNC, and IMAZON⁴⁸), municipal governments, large-farmers, ranchers, and the government at the local, regional and national level. In the face of the success observed in the Municipality of Paragominas in responding to Federal environmental Laws and actions to combat deforestation, the State of Pará soon adopted the PMV as a State Policy framework, expanding the actions to many other municipalities in the State. The participant municipalities shared similar socio-economic and environmental issues. Besides, the actions adopted under the PMV aimed at mainstreaming a set of federal and state policy, measures, and actions into the local level policy framework, providing critical inputs for the arrangement and promotion of better resource allocation and better management of natural resources.

The participation in the PMV is based solely on the voluntary co-management of natural resources. It has been enabled by pooling public and private interests to implement existing provisions for environmental protection under the context of the current environmental policy formulation, leveraging licensing mechanisms, such as the LAR⁴⁹ and CAR, promotion of more sustainable value chains at the municipal level, adoption of more sustainable management pacts, and deforestation-free commitments.

The establishment of natural resource and land use management was facilitated by the adherence to the CAR, which has already covered more than 75% of the territory, within a target of 80% by 2017.

⁴¹ In 2006, prior to the Federal Decree No. 6,321/2007 that provides for actions related to the prevention, monitoring and control of deforestation in the Amazon Biome. The municipality of Lucas do Rio Verde, in Mato Grosso, had already implemented the concept of Green Municipality in order to gain access to more selective markets. However, Paragominas, in the State of Pará, went further and began to implement changes in its productive base. In addition, in Pará, under the leadership of the State government, the Green Municipalities Program was created in 2011. IMAZON (2011).

⁴² The Critical Deforestation List is based on three criteria that evaluate the historical dynamic of deforestation at the municipal level: (a) total area deforested, (b) total area deforested in the previous 3 years; and, (c) an increase in deforestation rates in at least 3 of the previous 5 years (VIANA et al., 2012).

⁴³ Altamira, Brasil Novo, Cumaru do Norte, Dom Eliseu, Novo Progresso, Novo Repartimento, Paragominas, Rondon do Pará, Santa Maria das Barreiras, Santana do Araguaia, São Félix do Xingu, Ulianópolis (MMA Decree 28/2008); Itupiranga, Marabá, Pacaya, Tailândia (MMA Ministerial Decree 102/2009); and, Moju (MMA Ministerial Decree 175/2011). The municipalities of Paragominas, Santana do Araguaia, Dom Eliseu and Ulianópolis left the Critical Deforestation List a few years later. Paragominas was the first, in 2010 –reducing by more than 90% local rates of deforestation and forest degradation, followed by three others in 2012 (Government of the State of Pará, 2015).

⁴⁴ Links between deforestation and land tenure status are undeniable, as about three-quarters of rural properties in the Brazilian Amazon region do not meet the requirements of the CAR because of non-titled land. Under Federal Law No. 11,952 of 2009, the Ministry of Agrarian Development set up an initiative aimed at legalizing land tenure known as Arco Verde Terra Legal (Green Arc Legal Land), which drew together several ministries and federal agencies focusing initially on the 36 –later on the 43– municipalities with highest deforestation rates in the States of Amazonas, Maranhão, Mato Grosso, Pará, Rondônia and Roraima (BARRETO and ARAÚJO, 2012).

⁴⁵ Responding to the Federal Decree No. 6,321/2007 (Provides for actions related to the prevention, monitoring and control of deforestation in the Amazon Biome). For this reason we defined Paragominas as a pilot municipality of the PMV.

⁴⁶ Refer to the set of regulations and standards that subsidize the policies and initiatives that allowed the emergence of the PMV –citation 14.

⁴⁷ The Nature Conservancy and IMAZON in partnership with the municipal government in Paragominas initiated a series of meetings with rural landowners, resulting in a pact for zero deforestation and definition of an action plan that triggered initiatives for promoting more sustainable land-use practices and exiting the Critical Deforestation List.

⁴⁸ Amazon NGO supports the consolidation of a socioenvironmental management model and the Rural Environmental Register in eleven municipalities in the Amazon through monitoring of forest cover and GHG emissions, socioeconomic and forest diagnostics and training of agents aiming at reducing deforestation, forest degradation and associated carbon emissions.

⁴⁹ Licenciamento de Atividade Rural (Licensing of Rural Activity).

The PMV contains a specific axis for decentralization. It prioritizes shared environmental management in the participant municipalities. It works by pooling public and private interests among the main actors (e.g., the big companies involved in agricultural, cattle breeding, mineral, forestry supply chains). It seeks to set up and carry out their commitments at a common base. Also, the actors are subject to punitive political measures as well as fiscal and economic sanctions under the CAR and LAR schemes. In this framework, NGOs and universities offer technical and scientific instruments to advance the process and support informed compliance to environmental regulations (Da Costa and Fleury, 2015).

In a nutshell, Guimarães et al. (2011); Viana et al. (2012); and, Miccolis et al. (2014), also described this program as an innovative governance mechanism. Mostly because it promotes more sustainable value chains at the municipal level, by bringing stakeholders together to establish improved natural resource and land use management pacts. There is a strong normative framework behind all choices and actions, supported by federal and State provisions of technical assistance and resource availability for the adoption of more sustainable production techniques, ensuring land tenure and environmental regularization.

The decentralization, the governance structure as well as the clear definition of roles among partners remains as key features supporting the success in reducing deforestation rates under the PMV framework –19% drop in deforestation rates among participating municipalities, compared to 16% in the Brazilian Legal Amazon (GoP, 2019). However, the latest government data indicates most of the deforestation still occurred in the states of Mato Grosso and Pará, and marked a 13.7% rise over last 2017's figures (PRODES, 2019). While the rate does mark a significant rise between 2017-2018 period –when the rate of deforestation dropped 16% in a 12-month period –, it still marks a 72% drop from 2004 (the year Federal government launched command and control measures and policies to combat deforestation).

Moreover, the PMV demonstrated to be a useful tool to raise awareness and commitment among local stakeholders through the implementation of deforestation-free commitments, and by increasing the adoption of sustainable forest management, reduction of deforestation, and improved agricultural and grazing practices (GoP, 2019). However, further studies are required to confirm the level of awareness and commitment implications through the implementation of deforestation-free commitments in the Amazon basin. The review of the PMV framework showed that strategies were developed in line with local realities, aligned with needed territorial interventions driven by national and sub-national policies, such as the Sustainable Amazon Plan (PAS)⁵⁰, the Action Plan for Prevention and Control of Deforestation in the Legal Amazon (PPCDAM)⁵¹, and the Plan for Prevention, Control and Alternatives to Deforestation in the State of Pará (PPCAD/PA)⁵². As result, by March, 2019, from the total of 144 municipalities in the State of Pará, a significant number of 124 had adhered⁵³ to the PMV, reaching 75,61% of the municipalities registered in CAR. Also, 16 municipalities entirely comply with the Green Municipalities strict environmental rules and procedures.

3.4. Potential for improvement and perceived limitations

The PMV worked well to mainstream national and State⁵⁴ climate change adaptation and mitigation policies and programs into the local level, as well as a mechanism to enforce the new Forest Code directives in the Brazilian Amazon (IMAZON, 2015). The success of the PMV can be attributed to national environmental policies well articulated with the market forces, and supported by a robust technical and institutional capacity. However, the ongoing weakening of the environmental legislation and the re-characterization of monitoring and control bodies may pose some real risks related to the constitution of existing political and environmental arrangements resulting incompatible with local environmental needs (BRAZIL, 2019a). It may create

⁵⁰ Proposes a set of guidelines to guide the sustainable development of the Amazon with the valorization of socio-cultural and ecological diversity and reduction of regional inequalities.

⁵¹ PPCDAM is an Operative Federal Program to cope with deforestation issues in collaboration with States. In force since 2004 and coordinated by the Civil House, it is organized in three axes: (i) Territorial and agrarian order; (ii) Monitoring and control; and, (iii) The environment, and the promotion of sustainable productive activities.

⁵² Decree No. 1,697. June 5, 2009. Federal Official Journal No. 31,435 June 8, 2009. Seek to lead not only to the reduction of deforestation in the State but also to a collective commitment to maintain forest remnants; the first phase of the PPCAD/PA (2009-2012), was organized in (a) Territorial, land and environmental planning; (b) Promotion of Sustainable Activities; and, (c) Monitoring and control; (iii) reduction of deforestation rates for (a) the period covering 2006 to 2010, of 42%, compared to the baseline period; (b) 66% for the period 2011 to 2015, compared to the initial baseline; and, (c) of 42% in relation to the previous period (2006-2010); For the period covering 2016 to 2020 –it was observed a reduction of 80% in deforestation rates compared to the initial baseline, and of 42%, compared to the previous period.

⁵³ Municipalities that signed the TC/MPF or Term of Accession.

⁵⁴ State Decree No. 1,697, June 05, 2009; State Decree No. 1,900, September 22, 2009; State Law, No. 8,633, June 19, 2018.

gaps and overlaps of power, reducing the room for collaboration in the next phases of the PMV, as they might affect how the stakeholders adhere and respond to this environmental governance mechanism. Moreover, some features of the PMV reflects historical patterns adopted to combat deforestation that proved unreliable to promote sustainable development in the Amazon Basin. For this reason, many questions remain, often related to the risks imposed by political changes, and the recent restructuring of political forces at all levels –an important aspect that relates to the origins of PMV. The emergence of this innovative governance mechanism has deep roots in the need to respond to Federal command and control policies and actions.

Also, the PMV is structured around market-driven components based on different programs and policies that have limited capability to considerate smaller actors participation (MAPA, 2012; MAPA, 2018; Ferreira Costa, 2014; 2016a). Big players benefit most of PMV actions, since it has strong productive features. They have more opportunities to seize the benefits of their commitments in this forest governance scheme, while smaller actors and traditional communities face enormous challenges to committ to this mechanism. Small-holder farmers and traditional communities lack reliable conditions to participate in the decision-making process in the PMV because they lack economic representativity. Therefore, it is common for them to lack power and access to benefit from policies aligned with the market that has been systematically developed by previous governments to support agribusiness activities. In this regard, Nepstad et al. (2014), adds that punitive measures need to be complemented by positive incentives and finance at scale for landholders, smallholders farmers, indigenous communities, counties, and States to allow a sustainable transition to achieve lower deforestation rates, GHG emissions reductions, productive inclusion, and sustainable rural development.

The study shed some lights on the risks represented by promises of weakening Federal environmental legislation by the newly elected government of Brazil. Recent political instability brought uncountable changes, mostly culminating in far-right forces rising to power in Brazil (PSL, 2019; BRAZIL, 2019; 2019a). These forces may pose a threat to the continuity of Brazil in the Paris Agreement, and future climate negotiations, as Brazil withdrew its offers to host the COP 25 UN Climate Conference⁵⁵. Besides, ongoing changes in Federal climate governance schemes⁵⁶, through the restructuring of key ministries, and prioritization of productive issues over the environment foresee a real risk of regression throughout the normative and environmental governance apparatus created over decades.

The threats to the rainforest⁵⁷ and its people⁵⁸ and a still possible withdraw from the Paris Agreement are among the promises of the newly elected government. These changes came into force with the weakening of the Federal environmental bodies and environmental legislation emptying the powers of the Ministry of the Environment, and strengthening the Ministry of Agriculture (MMA, 2019; BRAZIL, 2019; 2019a), coupled with the extinction of the climate and renewable energy divisions of the Ministry of Foreign Affairs⁵⁹, with negative effects on the national climate governance framework. The recent government decision that pulled out Brazil of hosting 2019's United Nations global summit meeting on climate change⁶⁰, may indicate that the Latin America's largest nation no longer aspires to be an influential player in efforts to mitigate the negative effects of a human-induced climate change.

In this regard, a crucial aspect of the PMV –the environmental decentralization– is highlighted. As stated by Toni (2006); Sandbrook et al. (2010); and, Viana et al. (2012: 3), the decentralization of environmental policies can be positive if it delivers more power to the hands of municipal actors. However, some authors have claimed that in democratic countries special interest groups may enjoy disproportionate influence on policymaking (Mancur, 1965; 1982; Midlarsky, 1998). As a result, decentralization can have negative environmental impacts if governments (at all levels) lack the capacity for good governance. It allows major political

⁵⁵ The meeting tasked with moving forward the Paris Agreement.

⁵⁶ *Interministerial Committee on Climate Change*. NPCC (2007).

⁵⁷ MMA Circular Letter N° 5 –MMA– determines the lifting and suspension of the 90-day implementation of the agreements and partnerships, including terms of collaboration and terms of support with third-party bodies agreed by the Funds Administered by MMA, Ibama, ICMBio and JBRJ.

⁵⁸ Federal Provisional Measure No. 870, January 1, 2019 –It seeks to dismantles environmental governance, removes the rights of indigenous peoples, and opens up the indigenous' lands for logging, mineral and agricultural businesses.

⁵⁹ Federal Decree No. 9,683/2019-Itamaraty no longer has the Subsecretariat of Environment, Energy, Science and Technology and its divisions of Climate, New and Renewable Energy Resources and Sustainable Development. The duties of the undersecretary were pulverized among other structures, with the entire environmental area becoming part of a department of a new Department of National Sovereignty and Citizenship Affairs.

⁶⁰ Brazil abdicates a prominent role and has been occupying since 1992 in the multilateral negotiations for sustainable development –one of the few aspects of the international scene in which the country is born leader. The new green economy, defended at Eco92 and Rio +20 in Rio de Janeiro, shrinks to give space to old mineral extractivism and agribusiness, reinforced in the new Itamaraty structure.

and economic forces to have too much influence on what are often politically weak environmental arrangements (local level), negatively influencing enforcement of environmental legislation (Ribot, 2004). A situation that seems to be materializing in Brazil shortly, contrasting⁶¹ to what advocated Ferreira Costa (2016: 135), when he described the previous Brazilian political discourse on climate change –focused on the elimination of deforestation and conservation of lands and forests –as fundamental features of the new international strategic repositioning of the Brazilian government in international climate negotiations. Something that emerged from the country's need to adapt to changing global circumstances⁶².

If stakeholders find it harder to operate (and cooperate), that could mean less oversight of environmental responsible choices and actions, weakening voluntary commitments, which could have a negative impact far beyond the pooling of public and private interests. It may reduce the overall scrutiny on climate change actions and deforestation at the local level, contributing to increased deforestation rates and conflicts over land tenure in the Amazon Basin.

In this regard, the PMV still has some deficiencies, such as the lack of actor-tailored approaches to integrate less powerful actors, both in alternative production activities and in the provision of personalized technical assistance, as well as in the offer of high-quality, productive inputs and insufficiencies in transportation and infrastructure. In contrast, these productive features, and channels to new consumer markets, are significant factors that attract larger players (Heredia et al., 2010; Fernandes et al., 2012; Viana et al., 2012; and, Ferreira Costa, 2014). Still with much to evolve, the PMV must create bridges and involve countless potential actors. Smallholders farmers as well as traditional communities are still left on the sidelines under the PMV, as it has been struggling to include sufficient tools that go beyond productive features.

4. FINAL CONSIDERATIONS

The very success of the PMV can be attributed to the construction of sound environmental policies well articulated with the market forces, and supported by a robust technical and institutional capacity.

It seems that the Brazilian Amazon Basin has been witnessing a shift from merely regulatory and repressive initiatives towards more participative decision-making processes and actions aimed at protecting the environment. Enhanced awareness and planned actions to promote land cover conservation and reduce deforestation, tackling traditional predatory *modus operandi* along with international market demands, promoted a «new mentality», among stakeholders and, possibly, forged a higher and continued commitment to ordering supply chains, and environmental conservation processes at the local level; albeit landholders, smallholders farmers, indigenous communities, and small counties still face challenges to actualize its inclusion as a group (or groups) with decision-making power.

In this regard, the overarching challenge seems to relate to effectively reinforce the harmonization and coordination of conflicting policy agendas at multiple levels –international, national, subnational, and local–, while addressing the necessary articulation and coordination among different actors for effective implementation to fairly manage trade-offs between negotiated goals and voluntary commitments.

While the PMV showed excellent results in bringing together different partners and matching multi-level policies as well as promoting decentralization along with the effective political coordination and articulation among stakeholders, many aspects of this governance mechanism still rely on old national economic strategies: meet market pressures to maintain the exportation of raw materials, as Brazil have done since the beginning of its history. For this reason, this «innovative scheme» still need to evolve to be effective dissociate from traditional patterns, and bring productive innovation. Also, the PMV must prove that the success achieved in the reduction of deforestation rates does not succumb to the weakening of the environmental legislation and the reduction of the power of monitoring and control bodies, under the political choices and motivations of the new-elected government of Brazil, or future others. In this sense, civil society and international pressure can act as instruments for the maintenance of the commitments previously assumed.

Time is still needed to make sure that participative processes under the PMV will prove able to alter the dynamics of productive activities linked to deforestation and promote a lasting new sustainable econo-

⁶¹ The Brazilian environmental discourse in the international fora had been adopted as a way to incorporate national development needs and challenges –not as deterministic phenomena–, instead, as something to give form and expression to the construction of a new world order, where Brazil could be identified as a key player.

⁶² Such as the Anthropocene, the emergence of new global players, terrorism, far-right forces, among other issues.

mic basis, as well as lift people out of poverty in the participant municipalities on the short-to medium-term. However, the successes in the reduction of deforestation and the enhancement of compliance to progressive environmental legislation among the municipalities are achievements to be celebrated.

Moreover, further studies are still needed to understand better how forest governance mechanisms in Brazil will respond to the weakening of the environmental legislation –if it succeeds–, and how, large landowners and cattle breeders will behave when this process begin to affect some of their economic and productive interests. New challenges arise, while the needs for improved mechanisms for socioeconomic inclusion of the people of the forests, and the reduction of the rampant exploitation of Brazilian biomes remains. In this sense, the PMV, as well as other innovative governance mechanisms in Brazil struggle to evolve as robust tools to combat deforestation, land grabbing, and land degradation effectively.

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