

Analyzing Brazil's contemporary Carbon Market Foreseeing possible outcomes and opportunities

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Abstract: Brazil's forthcoming Carbon Market regulation signifies a pivotal stride toward fostering a more sustainable future and curbing greenhouse gas emissions. However, the multifaceted and distinctive landscape of the nation, encompassing its rich biodiversity, geographical uniqueness, and diverse land use, along with the pivotal role played by various economic sectors in Brazil's stability and trajectory, necessitates a nuanced approach. This comprehensive study focused into the possible future of carbon market in Brazil, critically analyzing the ramifications and intricacies of incorporating into emissions mitigation strategies for agriculture and livestock practices, a sector intimate with Brazil's financial stability and future trajectory. Furthermore, we reviewed the dynamics of Brazil's Voluntary Carbon Market, shedding light on the array of opportunities it presents, as well as the formidable challenges it poses. On both main topics provided above, we presented international comparisons and tried to perceive how to fit these factors in our national reality. Through meticulous examination, this research elucidated the current state of affairs within carbon trading in Brazil, and offered insights into the process, the predictions and expectation for the field. In essence, we aimed to cast a spotlight on the forthcoming realities that will unfold with the establishment of the regulated carbon market in Brazil. Additionally, to draw comparisons, we delineated potential future scenarios, and provided a comprehensive understanding of the implications for the nation's environmental, economic, and social aspects.

Keywords: Regulated Carbon Market, Voluntary Carbon Market, Agribusiness, Carbon Offsets, Carbon pollution sectors, Brazil's Carbon Market regulations.

1. Introduction

The future of modern politics in our world appears to hinge significantly on green initiatives and measurements. Taking this into consideration, the recent approval of regulated carbon market laws in Brazil stands as a positive step for our global image. However, we must critically assess whether these regulations truly align with the goal of fostering a more sustainable and ecologically conscious nation, one that can serve as a model for others, or if they are flawed and lack essential elements needed for genuinely fight climate change. We asked ourselves, in the reality that faces Brazil, about the future actions that can be taken to regulate this type of market, such as the need to rightfully incorporate additional sectors and agents, such as livestock and agriculture into the regulatory framework in a vast and prosperous place as our country. Alongside the land capacity, the natural vegetation and woodland full of potential that we possess, raising the question to its necessity for an assertive delimitation and regulation, aiming to assure real claimed improvement in the atmospheric sequestration and release of Greenhouse Gas emissions, even with our continental boundaries, remote and almost lawless forestry regions. Through literature review and a vigorous analysis considering national perceptions

and international realities, we aim to clarify those questions and provide a clearer perspective of Brazil's structures and singularities.

2. Methodology

Literature Review Approach: This study employed a comprehensive literature review methodology, drawing upon diverse sources to investigate carbon dynamics in Brazil and assess opportunities for future mitigation strategies. The following main sources were utilized:

- **Peer-Reviewed Articles, Thesis and Dissertation:** A wide range of peer-reviewed articles covering various aspects of carbon dynamics, including soil management practices, carbon markets regulatory frameworks, carbon offsets and case studies, were accessed. These articles were primarily sourced from reputable academic databases such as Elsevier, ScienceDirect and Google Scholar.
- **OCBIO Reports and Analyses:** Carbon reports and analyses published by the OCBIO (Bioeconomy Observatory) provided valuable

insights into current carbon stocks, fluxes, and trends within Brazil. These reports were reviewed to understand the dynamics of carbon sequestration, land use change, and deforestation patterns across different regions.

- **ICC (International Chamber of Commerce) Brazil:** Publications from the ICC Brazil offered a global perspective on carbon markets and opportunities, allowing for a comparative analysis between Brazil and other countries. Graphics, datas, and tables presented in these publications were utilized to illustrate international trends and identify potential strategies for Brazil's carbon market development.
- **SEEG Brasil Data and Analyses:** The System of Estimates of Greenhouse Gas Emissions and Removals (SEEG) is an initiative of the Climate Observatory, providing annual estimates of greenhouse gas emissions in Brazil, analytical documents on emission trends, and a digital platform hosting the system's data and methodology. SEEG Brasil data and infographics were incorporated to provide a panoramic view of emissions and removals of greenhouse gases in Brazil, offering contextual insights into the country's carbon dynamics.

Data Extraction and Analysis: Accordingly with the sources mentioned above, we systematically extracted and analysed data quantitatively and qualitatively to emphasize and identify opportunities for future mitigation strategies, tendencies in the world relating to the best practices of marketing the carbon trades and how Brazil's government should be alert in two major points: agribusiness participation in the regulated carbon market in Brazil and the Voluntary Carbon Market (VCM) practices within our complex territory reality. Graphical representations, tables, and statistical analyses were utilized to present collected data effectively and facilitate comparative assessments across different datasets.

3.Results

The Law project, PL2148/2015, regulating the carbon marketing in Brazil, creating our Greenhouse gas emission trading system (SBCE) has been approved last year in the deputy chamber in Brazil and now, in 2024, waits for its conclusion in the senate [1].

Standing with clear similarity to the European carbon market, that operates since 2003 in the continent and has been put as one of the most preeminent and efficient regulation for carbon market [2, p. 2]. Now, with the SBCE, Brazil will be able to implement the cap-and-trade system, with ETS.

Having the large scale from the country in consideration it is easy to perceive the need for assertive regulatory agencies to work in this market and keep the trace of companies, industries, landowners in the diverse economic sectors that influence the life in Brazil, such as the agribusiness, deriving from the extensive land and fertile soil; the industry, ranging from a variety of goods, food and products; the use of land and tourism from the vast forests and natural beauty accounting a biodiversity in large scale. We will focus on two major aspects that stole the attention of specialists and the international community with the continuation in this new form of regulation in the Carbon Market when comes to Brazil's reality: Agribusiness and the Voluntary Carbon Market (VCM).

3.1. Agribusiness

For an effective decarbonization process, economic agents need to consider the peculiarities of Brazil's economic structure, the main causes behind environmental degradation and the context of finite availability of natural resources. 'Agribusiness has long been a cornerstone of Brazil's economic development, with the country's economic history marked by notable booms in key sectors such as coffee, cattle, sugarcane, rubber, and cocoa.' [3, p. 1]. These periods of prosperity vividly underscore the significant economic and social contributions of the agricultural industry.

Today, Brazilian agribusiness stands as a powerhouse, making substantial contributions to the nation's economy. It accounts for a remarkable 22% of the GDP, nearly 40% of exports, and employs a third of the country's workforce. Brazil's importance in global food production cannot be overstated, as it currently supplies one in every four grains consumed worldwide. Looking ahead, Brazil's readiness to potentially satisfy 40% of the projected increase in global food demand by 2050 further highlights its pivotal role in shaping the trajectory of agricultural development on a global scale. This underscores the country's significant influence and potential to address the pressing challenges of food security and sustainability in the years to come [4, p. 17].

It is known that when defining a new project and law for any place in the world, it's common to draw your attention into successful cases that have been done before. Hence, improving your success in doing the same, or the relatively new and improved idea, in the better way as possible. With that being said, we realise that worldwide, when comes to market regulating carbon emissions, many of the leading countries to join in this activity, do not consider the sector of agriculture and livestock in the cap-and-trade system. Likewise, in Brazil's case, it is no different from most markets. Attested by the law being approved to regulate our carbon market, that presents as one of their main characteristics that all companies and industries, emitting between 10.000

to 25.000 tCO₂ will be taking place under our carbon market, exempting only the Agribusiness sector from being regulated [2, p. 1]. The question here, is to whether this consideration is the best and more adequate in our national scenario.

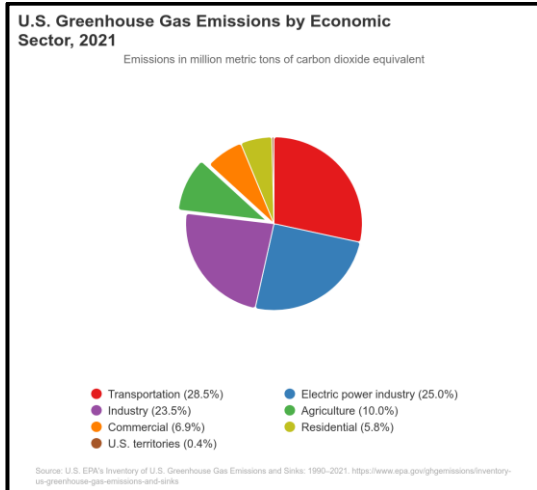


Fig.1- Source: U.S EPA's Inventory of U.S Greenhouse Gas Emissions and Sinks: 1990-2021. [5]

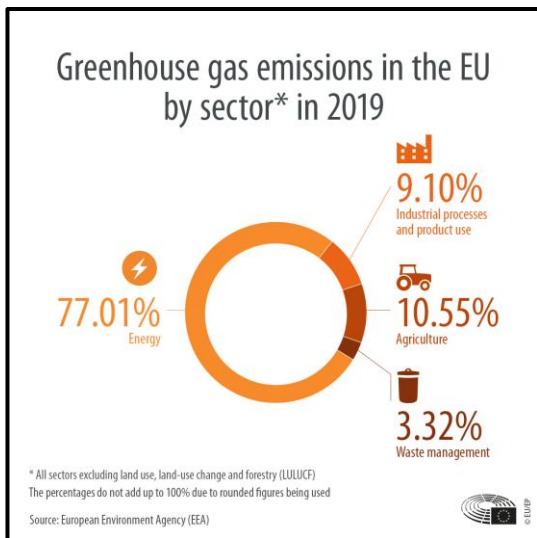


Fig.2- Source: European Environmental Agency (EEA). [6]

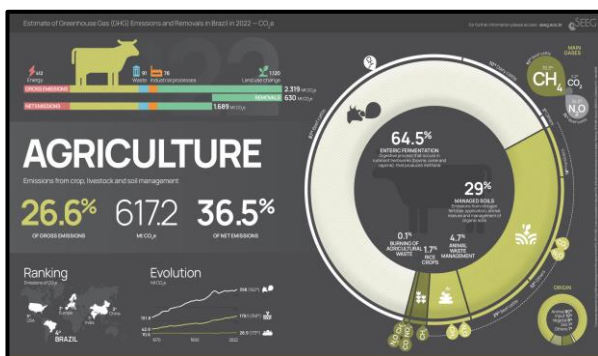


Fig.3. Source: SEEG infographics 2023. [7]

Making an analysis over the figures shown above, we can identify that the United States and the Europe Union, both with the agriculture representing less than 11% of their sectors emission, must not be taken as the leading reference to our ground basis to the inclusion of the Agribusiness in our regulated carbon market. Since Brazil, a country with 26.6% of emission in the same sector, an increase of more than 240% in perspective from these other international markets, has different needs to be considered in our law.

Reenforcing our previous statement, we can look at the viewpoints of specialists shedding light on this critical aspect overlooked in recent legislative decisions. Stela Herschmann, a climate policy specialist at the Climate Observatory, offers a poignant critique, condemning the exclusion of agriculture from emissions regulations. She asserts that this oversight neglects a substantial portion of Brazilian emissions, rendering the legislative text 'limited and insufficient' from its very inception [8]. This perspective is rooted in the stark reality that farming, including livestock rearing, stands as primary contributors to deforestation and greenhouse gas emissions in the country.

"It is unacceptable and inconceivable that the agricultural sector is excluded from the emissions reduction targets," emphasized Beto Mesquita, Director of Public Policy and Forests at environmental finance nonprofit BVRio [9]. This omission is viewed as a significant flaw, highlighting the urgency of incorporating this sector into Brazil's carbon market [9]. Especially taking the awareness over the relevance of agriculture and livestock, that are responsible for almost a third of all the gas emissions in the country [10, p. 7].

Considering this reality, it became clearer the reason why the level of consideration and effort put in countries like the USA or the European union, leaders in the regulated carbon market in the world, to include this sector is relatively low. In contrast, it enhances the posture that must be taken by Brazil, a country that relies on the very same factor for its economic growth and tends to be increasingly more polluter in the field. Altogether, added to our national scenario a known fact that 'the energy transition alone will not fully decarbonize Brazil's economy.' [11, p. 10] and to do so, would require significant disruptive measures that change the perception and the ground basis of what is commonly done nowadays. Consequently, by truly taking actions in regulating the agribusiness sector in our carbon market regulation, Brazil would be standing as a leading example for the world, and we would be taking a huge step towards a leadership in this field, presenting ourselves as a one of a kind, aiming to honestly achieve our sustainable goals, leading to a different world perspective on how much can we

actually take part in mitigating the GHG emissions.

3.2. The Voluntary Carbon Market

'Voluntary carbon market refers to a variety of organizations that allow individuals or businesses to purchase offsets from emissions reduction projects located around the world' [12, p. 8].

Regulations, in those limits, are less rigorous regarding how and where emissions are reduced or captured. These organizations advocate for a variety of projects, such as promoting low-carbon energy, improving energy efficiency, and carbon capture initiatives. The origin of greenhouse gas emissions and the location to which it was emitted is irrelevant within the global climate change point of view, hence, the VCM is global. Buyers and sellers can be found in numerous places worldwide. [13, p. 1],[14, pp. 33-34].

Starting from the very perspective of the easy participation and collaboration with this form of credit market, we can imagine how much environment from countries with vast forests and natural areas have an advantage, due to practical means they provide to create a market to be sold from their natural facilitated cap system. As it is the case of Brazil, a country in which the natural forests, in these tropical area with numerous biomes can offer a rich opportunity to invest.

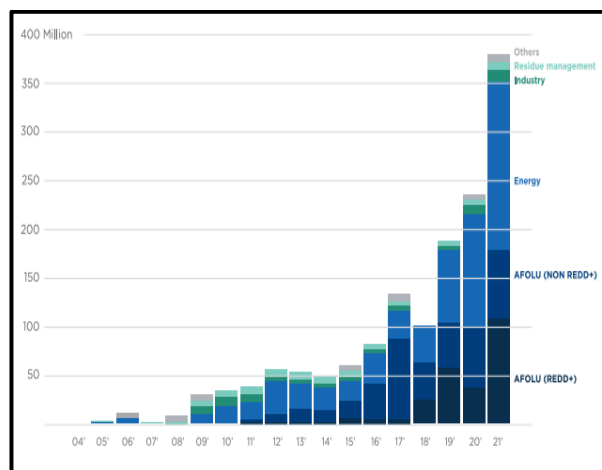


Fig.4 - Source: Voluntary Carbon Market in Brazil in reality and in practice OCBIO. [15]

We can analyse, through the figure above, the flow throughout the years in the Voluntary Carbon Market, according to their total amount of carbon credits generated and the main sectors responsible for their generation in each year. The Agriculture Forestry and Other Land Use (AFOLU), as was predicted, shows to be the most preeminent part in the VCM trade in Brazil. That mainly happens due to numerous reforestation and preservation projects that can easily happen under our humid, rainy and

tropical territory. Emphasizing how much of potential the country has, since 'in this emission reduction accelerated scenarios, the demand for credits in the voluntary market would be between 1,500 and 2,000 MtCO₂e by 2030 (TSVCM, 2021), where Brazil could potentially offer between 22.3 and 48.7% of the credits in the voluntary market.' [16, p. 35]. This expansion not only bodes well for the future, especially within the realm of Voluntary Carbon Markets (VCM), but also ensures a sustainable future for generations to come, and the possibility that 'these projects can channel funds and technologies to help developing countries build economies that are less carbon-intensive' [17, p. 6], as stated by V. Battocletti et al.

Now, the perspective we must remember, relies on how to identify the quality of those credits in the Voluntary Carbon Market, since these qualification standards are the main responsables to ensure the achievement of our climate change ambitions, and make it possible for the carbon market to perceive their goes. Through this global challenging scenario of ensuring the credits excellency, many criteria must be taken into consideration. However, a key one will be place into perspective: the Additionality. Its definition can be perceived as a mitigation activity that would never take place in the absence of the additional incentive created by this carbon market environment [16, p. 37]. Essentially, stating that 'an additional project means that the only way the project would exist is because of the funding from carbon credits. In order to qualify as a genuine carbon offset, the reductions achieved by a project need to be "additional" to what would have happened if the project had not existed.' [18].

The urge to raise attention in these occasion lies on the reality of the VCM highlighting that the lack of bureaucracy measures and the lower prices, due to the very same point, facilitate the trade of those credits. Quite in the opposite direction, these lower standards of regulation face the cruel reality of not being able to assure the real benefits claimed to be made by the credits sold, since they face a multitude of regulation standards and monitorization methods [12, p. 8].

Recently, the breaking cases of fake offsets projects that were controlled by the verra organization, presents weel enough that threat. The risk is attested after the denunciation by the Public Defender's Office of Pará, a northern state in Brazil, against companies and individuals involved in carbon credit projects in Portel. These projects, despite certification by the leading international body Verra, allegedly had little-known companies unlawfully seizing public lands in the Amazon, misleadingly treating them as private areas to profit from selling carbon credits to multinational corporations, ranging from Air France, Boeing, Braskem, Toshiba and the Samsung UK. These initiatives generating carbon credits overlapped five settlements which are state-owned lands titled by the government of Pará, housing at

least 1,484 riverside families across communities along the riverbanks. Collectively, the five settlements encompass over 3,300 Km² of public forest, [19] almost three times the size of the city of New York. This highlights the opaque regulations and complicated land rights surrounding such ventures, that makes it hard to secure the essential factor of additionality in these carbon trades. Hence, these projects fail to offset emissions as claimed, leading to accusations of fraud.

Nilson Corrêa da Silva of the Portel Rural Workers' Union condemns the deceit, noting that buyers are misled into thinking they are contributing to climate change mitigation when, in reality, the projects are non-existent. Mario Braga, a political risk analyst at Control Risks emphasizes 'Companies [buying credits] often rely on international best practices and limited third-party verification. Especially in the Amazon, some peculiarities can represent significant obstacles, such as widespread land-grabbing' [21]. These revelations cast doubt on the legitimacy of carbon offset projects and underscore the need for rigorous due diligence and transparent regulations to ensure ethical and effective environmental initiatives.

Another study reflecting the same unfortunate reality in Brazil on not effectively offsetting GHG emissions lays down in the T. A. P. West et al article, in which they researched the efficacy in our country in projects from the AFOLU (REDD+), meaning climate change mitigation through the reduction of carbon emissions from deforestation and forest degradation. Throughout their analyses for 12 REDD+ projects, the attesting result was that in 8 of them no significant evidence of reducing the deforestation was found [16, p. 38]. In conclusion they said: 'Overall, we find no significant evidence that voluntary REDD+ projects in the Brazilian Amazon have mitigated forest loss.' [20, p. 2].

Despite such great potential that Brazil has to profit, economically and socially, with the VCM taking place in his territory, we realise that this opportunity is not to be granted. For instance, as a way out for better results, in this case we could potentially be inspired by looking up to governments that in the past have been working on the improvement of those markets in their nation with their own realities and needs. As presented by Michael Gillenwater et al in saying 'Some governments are beginning to respond to the need for oversight of these voluntary markets.' [13, p. 2]. In January 2007, the UK's Department of Environment and Rural Affairs drafted a code of best practice for the voluntary GHG offset market, and in July 2007, the Australian government announced that it would provide a government-administered program for businesses and households to become 'carbon neutral' via approved offsets [13]. In all, actions like those could minimize our threat of people that are profiting from their claim to be preserving areas that are already preserved, whether by government delimitations or for the fact they

were never in risk of being destroyed.

4. Conclusion

In conclusion, the implementation of carbon market regulation represents a significant step forward for Brazil, not only in terms of enhancing its international standing but also in fostering a more sustainable future for the nation. This regulatory framework not only enhances Brazil's image on the global stage but also booster its international credibility, paving the way for a more promising and environmentally responsible trajectory.

Despite the prevailing stance adopted by leading foreign nations for carbon regulation in rejecting the agribusiness sector, it becomes evident that Brazil's inclusion of agriculture and livestock within its regulatory framework is indispensable. By tailoring legislation to accommodate the unique nuances of Brazil's agribusiness sector, we not only address our own environmental challenges but also set a precedent for future change in existing markets and the new ones to come worldwide. Hence, demonstrating a willingness to confront global challenges head-on, positioning Brazil as a proactive player on the world stage.

Furthermore, when discussed the peculiarities inherent to Brazil's landscape and the potential we have in increasing our native cover vegetation and incentivizing the care with our nature, we saw that there is a great opportunity for us in realizing that our forest is more worth when alive than being cut off and dead. Drawing attention to these intricacies and advocating for better delineations and oversight mechanisms we can, by pursuing sustainable land management practices, not only protect our environment but also unlock new economic opportunities as it is the case of the Voluntary Carbon Market (VCM). Highlighting the urgency of this, we emphasize the need for transparent regulations and robust government oversight and delineation of responsibilities to ensure that our efforts yield tangible and verifiable results in reducing greenhouse gas emissions. This underscores the imperative of prioritizing ecological preservation while simultaneously pursuing profitable revenues that align with environmental objectives and a greener economy.

In essence, Brazil stands at a pivotal juncture in its sustainable journey, wherein the implementation of carbon market regulations signifies a collective commitment towards a more sustainable future and intertwining environment, economy, and diplomacy. By embracing our unique position and leveraging our natural resources responsibly, we can chart a course towards environmental efficacy and resilience, as well as an inclusive, greener and conscious economic growth, alongside with the needs and realities of our society being put into perspective. Through concerted efforts and collaborative partnerships, we can translate our aspirations into tangible actions that benefit both

present and future generations.

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