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COVID-19 pandemic: An increase in Brazilian deforestation

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ABSTRACT
The objective of this research was to verify the increase in Brazilian deforestation rates during the Covid-19 pandemic. The research used was the bibliographic and the data used were of secondary origin obtained on the website of the National Institute for Space Research and the System for Estimating Greenhouse Gas Emissions of the Climate Observatory. The results showed that the rate of deforestation in the Legal Amazon increased by 35% due to the decrease in inspection and the relaxation of environmental legislation supported by the Federal Government. It was expected that with the reduction in economic activity due to the social isolation necessary to combat the Covid-19 pandemic, there would be a reduction in deforestation, but illegal deforestation activities continued with more intensity. Public power must assume the main role in combating deforestation actions since the preservation of natural environments is essential for the survival of human beings.

Keywords: Deforestation, Pandemic, COVID-19 Amazon.

1 INTRODUCTION

The human being has harmed the productive capacity of natural resources, thus expanding the world's concern for the environment. Productively using the environment does not mean having to harm it, harmony between man and the environment in which he lives is possible. It is known that farmers, for their subsistence, use natural resources intensively, depleting the productive capacity of the soil.

The constant challenge is to make the population aware of the environmental issue, showing that natural resources cannot be explored indefinitely, as they are limited. Joint action by all sectors of society, across the planet, is necessary to reduce the impacts already caused and ensure the conservation of areas not yet explored.

However, the deforestation of environmental areas such as the Amazon rainforest continues to occur, as these areas have a complex and rich biodiversity, thus attracting different types of productive and largely destructive interests. According to Fearnside (2005), biodiversity is not the only victim of deforestation. Other ecosystem services are also affected, such as soil erosion, loss of nutrients and the regulatory functions of the watershed, and the emission of greenhouse gases, these emissions being very harmful to the ecosystem.

According to the Ministry of the Environment (MMA, 2012), deforestation is a direct consequence of the absence of policies based on sustainability. In Brazil, policies are still needed to regularize the land situation, disseminate a new model of exploitation of agriculture and the timber and mining industry, and improve the structure and technology of inspection, licensing and forest management bodies.

Despite the lack of efficiency in the application of laws that protect the environment, Brazil created in the 1960s the Brazilian Forestry Code in the 1980s the Federal Constitution. In addition, some bodies were created to supervise and regulate activities in environmental areas, such as the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA).

The Brazilian Amazon began to be exploited in a more accentuated and harmful way in the 1970s, in which population migrations intensified. According to Alencar et al (2004), in the late 1990s and early 2000s, the Amazon underwent a second phase of occupation, in which tax incentives played a reduced role, but the profitability of extractive and agricultural activities boosted expansion. and the transformation of the border of Brazil.

According to the National Institute for Space Research (INPE), deforestation in the Amazon Forest had a process decrease in its rates in the period between 2004 and 2012, from 27,772 km² in 2004 to 4,571 km² in 2012. Assunção et al (2012) state that there are two explanations for the reduction in deforestation, one of them is that the agricultural product gets a price drop and thus they do not look for new lands to produce; and new policies to combat deforestation.

Also according to INPE, in 2013 the deforestation rate increased again to 5,891 km². In 2014, there was a reduction to 4,848 km² deforested. In the following years, 2015 and 2016, the increase in deforestation continued, with a decrease in 2017. Between 2018 and 2019, deforestation rates increased from 7,536 km² to 9,762 km², thus showing that the Brazilian deforestation rate has steadily increased.

The numbers show that the trend is for deforestation to also increase in 2020, as deforestation alerts in the Amazon grew 63.75% in April when compared to the same month of 2019, according to INPE. This increase occurs amid the Covid-19 pandemic, a period that requires social isolation, thus making inspections regarding illegal activities carried out in the Amazon region more difficult.

Based on the above, the objective of this research is to verify the increase in Brazilian deforestation rates during the covid-19 pandemic through the data available at INPE, to identify possible justifications for the negative impact of the pandemic on deforestation.

2 ENVIRONMENTAL POLICY AND BRAZILIAN DEFORESTATION

Capitalism brought social domination over nature, as this is considered an obstacle to be overcome in the pursuit of civilization progress. The capitalist system recreated human nature and its

needs since human beings used nature for their subsistence before, and after the unbridled adoption of capitalist thinking, they exploit nature's resources more intensely to sell them and thereby obtain profit, which is the main objective of this system, without worrying about the use of natural resources and their degradation.

For Smith (1776) the forces of the economy lead to a harmonious result in economic and social terms. But over the years this is not what has happened, this harmony does not exist, since the capitalist system privileges economic strength, in which the most crucial thing is profit, no matter what needs to be done to achieve it. In this way, one aspect grows, in the economic case, to the detriment of others such as social, environmental and cultural. It is important to emphasize that the environmental aspect was not much talked about at the time in question, since natural resources were not used in such an intense and predatory way as they are today. The problem is that human behavior in recent times has constantly degraded natural resources and this has brought harmful consequences to society as a whole, such as global warming and the scarcity of essential resources such as water.

The debate on environmental policy is very incipient in Brazil, unlike what happens in other countries, which are already more advanced when it comes to this subject. In Brazil, policies were more focused on the objective of economic growth, increasing the country's wealth, without any concern for natural resources and their sustainability. Economic policies were the main objective of the rulers, however, from the United Nations Conference on the Environment, in 1972, most countries became concerned with environmental protection, including Brazil. There was, however, no coordinated action by the government or by an entity responsible for environmental management, thus making it difficult to promote ideas about environmental conservatism.

After 1972, environmental ideas became more talked about, thus consolidating the theme worldwide, as part of the population was already concerned about the future of humanity, due to the excessive exploitation of natural resources. According to Lustosa and Young (2002), the Brazilian environmental policy elaborated after the Stockholm Conference was based on pollution control and the creation of nature conservation units. It wasn't ideal, since the use of natural resources covers several situations, but it was already the beginning of a concern to protect natural environments.

Brazilian environmental policy began in the first government of Getúlio Vargas intending to order the use of natural resources. In 1934, the Forestry, Waters, Mines, Hunting and Fishing Code was created and the first Brazilian Conference on Nature Protection was created, in addition to the creation, in 1937, of the Itatiaia National Park and legislation to protect historical and artistic heritage. national. According to Salheb et al. (2009) the first moment of Brazilian environmental policy was marked by two basic concerns: the rationalization of the use and exploitation of natural resources and the definition of permanent preservation areas, thus establishing some limits to private property.

In 1958, the first Brazilian environmental agency was created, the Brazilian Foundation for Nature Conservation. In the 1970s, the Special Secretariat for the Environment was created, bringing up the discussion on pollution and deforestation, at the same time that the government encouraged the colonization of the Amazon and civil construction in the main Brazilian cities. In 1981, the National Environmental Policy was formulated, introducing environmental protection areas and ecological stations in the country. The "Our Nature" Program, in 1988, created the Brazilian Institute for the Environment and Renewable Natural Resources. During this period, a specific ministry was also created to deal with the issue, thus recognizing the concern of public authorities in conserving natural resources. And in 1992, Brazil was chosen as the host of the United Nations Conference on Environment and Development, thus contributing to a greater debate about environmental policies (ALMEIDA, 2002).

The “Eco-92” meeting marked the discussion on sustainable development, held in Brazil, with the participation of representatives from almost all countries to discuss the need to internalize environmental problems in decision-making processes, both in the political and economic spheres. (SIRVINSKAS, 2009). Until then, discussions had been held about the economic development of countries, which consisted of increasing the wealth of a country combined with better living conditions for the population, such as access to health, education, housing, sanitation, and culture, among others. What was not in question was the use of natural resources that are essential for the economic growth of a country, but how to continue growing and not degrade the environment? It would be possible? The new definition of development brings the idea of sustainable development, which consists of not only growing economically and the well-being of the population, but the conscious use of natural resources and the stimulus to think of new ways of producing, in which degraded little or no use of natural resources.

For Veiga (2000), the notion that comes closest to the discussions on sustainable development are the ideas of Amartya Sen, in 1996 and 1997, with the notion of development as freedom, in which freedom could never be restricted and understood as per capita income, and should cover cultural, social, environmental issues, among others.

Still at Eco-92, Agenda 21 was elaborated. According to the Ministry of the Environment (2013), Agenda 21 was a planning instrument for building sustainable societies, in different geographical bases, which reconciles methods of environmental protection, justice social and economic efficiency, linked to combating desertification and resistance to the effects of droughts in the arid, semi-arid and dry sub-humid zones of the planet.

It is important to modify the current relationship between human beings and nature, which is exploratory, as barriers are created for the future by using natural resources excessively, producing

scarcity, polluting the environment, deforesting, extinguishing species, and heating the planet, among others. According to Freitas (2007) in approximately three hundred years man has already destroyed 50% of the world's natural green area. Brazil is responsible for a significant portion of the devastation, as it has already destroyed 40% of its total forests.

Faced with this situation, the population needs to change its actions so that nature is preserved and with it the resources we need to survive. According to Fonseca (2007), the main activities responsible for the deforestation of Brazilian forests are agricultural and extractive, in addition to poor management of urban waste.

Brazilian deforestation is the result of legal and illegal productive activities. There is an urgent need for public policies aimed at the environment, especially in locations where activities are very intense and frequent. In addition to enforcing current legislation and reducing the expansion of activities that harm the environment.

For Fearnside (2005) the main strategies to slow down deforestation are repression, through licenses, inspections and fines; political reform on taxes, credits and subsidies, to reduce tax subsidies for ranches raising cattle and other crops in areas of deforestation.

The remarkable decrease in deforestation rates in Brazil provides important lessons about the importance of creating public policies, strengthening monitoring systems, and intervening in the production chain to make the work of those who insist on practicing illicit activities more difficult (NEPSTAD, 2014).).

Environmentally educating the population is one of the most viable and far-reaching solutions, however, it is necessary to invest in the dissemination of this knowledge not only for producers who work using natural resources but for society as a whole. It is important to show them that there is a way to continue working, supporting themselves, and protecting natural environments.

3 RESULTS AND DISCUSSION

The research used was bibliographical, according to Fonseca (2002) any scientific work begins with bibliographical research, which allows the researcher to know what has already been studied on the subject. The data used are of secondary origin obtained on the website of the National Institute for Space Research (INPE) and the System of Estimates of Emission of Greenhouse Effect Gases (SEEG) of the Climate Observatory.

The relationship between Brazil and deforestation is not recent, studies indicate that at the time of Portuguese colonization, action was already taking place for the exploitation of natural resources abundant in Brazilian soil. In the 1970s there were high rates of deforestation and in 1995 it reached a high peak not seen in Brazilian history until then. According to Folmer and Kooten (2006), the causes

of deforestation are the combination of several factors, such as agricultural expansion, timber trade, population growth, and road construction.

The consolidated rate of deforestation for the years 2018 and 2019 of the nine states belonging to the Brazilian Legal Amazon (ALB) is shown in Table 1. This rate is calculated by the Monitoring Project for Deforestation in the Legal Amazon by Satellite (PRODES). Data show that the rate of deforestation in the Legal Amazon increased by around 35%, mainly due to the substantial increase in deforestation rates in Acre (53.60%), Pará (52.04%), and Roraima (202.56%). These results achieved by the territory of the Legal Amazon have occurred due to the decrease in the inspection of these areas and the relaxation of environmental legislation supported by the Federal Government.

Table 1: Deforestation Rates for the years 2018 and 2019

State	2018 (km²)	2019 (km²)	Variation (%)
Acre	444	682	53,60
Amazonas	1.045	1.434	37,22
Amapá	24	32	33,33
Maranhão	253	237	-6,32
Mato Grosso	1.490	1.702	14,23
Pará	2.744	4.172	52,04
Rondônia	1.316	1.257	-4,48
Roraima	195	590	202,56
Tocantins	25	23	-8,00
Amazônia Legal	**7.536**	**10.129**	**34,41**

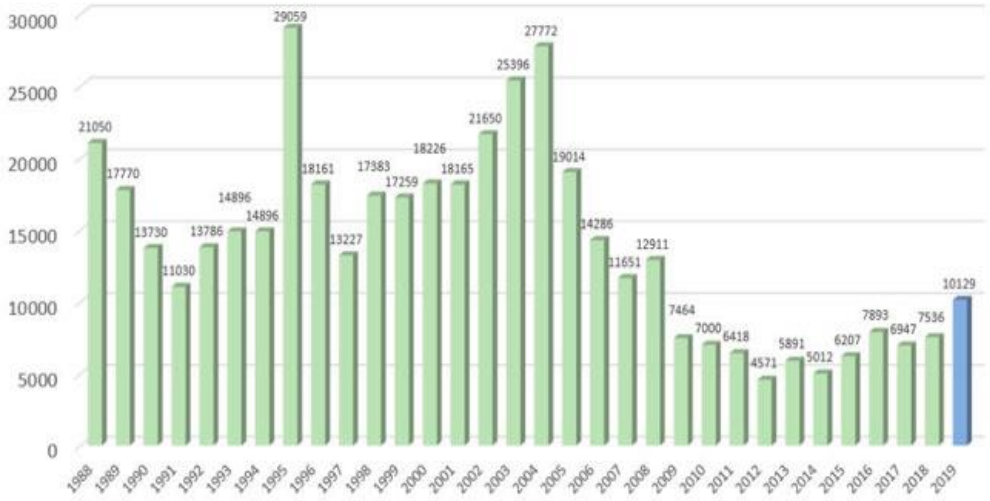
Source: National Institute for Space Research (2020)

In the analysis of annual deforestation rates in the Legal Amazon over the last 20 years, significant changes in Brazilian deforestation can be seen, as shown in Figure 1. The worst Brazilian results occurred in 1995 (29,059 km²) and 2004 (27,772 km²). After 2004, Brazilian deforestation rates began a strong reduction, reaching the lowest rate in 2012 (4,571 km²).

According to Arraes et al (2012) in 1995 the deforestation rate reached its highest level and as a consequence, there is also degradation that contributes to the loss of biodiversity, reduction of water cycling, and global warming, mainly through fires, by emitting gases that contribute to accelerating the greenhouse effect process.

In 2004, to combat deforestation and other environmental crimes, the Action Plan for the Prevention and Control of Deforestation in the Legal Amazon was launched. This plan prioritized the viability of a new development model in the Amazon region, based on social inclusion with respect for cultural diversity, in addition to enabling various economic activities through the sustainable use of natural resources (BRASIL, 2004).

Figure 1: Consolidated annual deforestation rates in the Brazilian Legal Amazon in km2



Source: National Institute for Space Research (2020)

Segundo o **Instituto Nacional de Pesquisas Espaciais** (INPE, 2020) o increase in cases of Covid-19 in Brazil coincides with the increase in records of destruction of the Amazon rainforest. In the first four months of 2020, the increase in deforestation was 55% compared to the same period in 2019. However, it was expected that with the reduction in economic activity, there would be a reduction in deforestation.

Brazil is bucking the world trend of low emissions in 2020, due to the increase in deforestation during the Covid-19 pandemic. Greenhouse gas emissions should rise between 10% and 20% in Brazil in 2020 compared to 2018. The expectation is that the recession caused by the pandemic will reduce greenhouse gas emissions by 6%. In 2018, Brazil emitted 1.9 billion gross tons of CO2. The expectation is that emissions in 2020 will be between 2.1 billion and 2.3 billion gross tons, depending on the progress of deforestation in the Amazon (CLIMATE OBSERVATORY, 2020).

Also according to the Climate Observatory (2020), Brazil will hardly meet the goals of the National Policy on Climate Change for the year 2020. The goal would be to reduce the rate of deforestation in the Amazon by 80%, but with data from the first months of 2020, high deforestation rates and few actions by regulatory bodies are identified, thus showing the country's low commitment to environmental issues.

Illegal deforestation activities continue even more intensely during the social isolation necessary to combat the pandemic. According to the deforestation alert system of the National Institute for Space Research (INPE, 2020), in January 2020 there was a 52% increase in the area under deforestation alerts compared to the same month of 2019, and in February was 25% higher than the same month in 2019.

For the Climate Observatory (2020), the strong increase in deforestation in the Amazon in 2020 tends to offset the expected drop in emissions in the energy sector and industrial activity. Another factor for the increase in emissions in Brazil is the reduction in meat consumption, since in April cattle slaughter fell by 20%, and livestock alone accounts for 20% of emissions in Brazil, as the reduction in slaughter means more cattle on pasture and, therefore, more emissions.

It is necessary and urgent that the government assumes the main role in combating deforestation actions since the preservation of natural environments is essential for the survival of human beings. In 2020, the Federal Government created the Amazon Council and the National Environmental Force, both intending to protect Brazilian diversity. However, when analyzing deforestation rates, there is no evidence that effective actions are being put into practice in the last months of 2020.

The acceleration of deforestation and emissions stems directly from the actions of the current Brazilian government to dismantle control plans, on the one hand, and encourage environmental crime, on the other (OBSERVATORIO DO CLIMA, 2020). Some analysts claim that creating new bodies and sending the army to protect the Amazon is not enough, since the bodies that have been operating in this area for several years do not have the necessary support from the public power, thus making it difficult to inspect and educate the population's environment.

Regardless of the government, it is crucial to encourage environmental education, from primary school to graduate school, making the population understand the importance of the diversity and richness that the Brazilian Amazon. Thus stimulating the feeling of belonging and protection of the local community with the natural environment.

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