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Brazil, 200 years of devastation: What will remain of the country after 2022?

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Introduction

ALTHOUGH suffering from the limitations of all radical historical scrutiny, the proposal for an overview of Brazilian society in 200 years and at three major points in time (sovereignty, 1822; modernity, 1922; and crisis, 2022) is welcome.

What we lose in our knowledge of the various concrete historical situations we gain in our perception of the constants that define this history. Well before 1822, two structural features that constitute our society had been established: slavery in relations between humans; and destruction in humans' relations with the natural landscape and with other species. These two constants give Brazilian society three global records: [1]

(1) Brazil was the colony, and later the country, which enslaved the most individuals throughout slavery's universal history. According to data from slavevoyages.org, the Caribbean and South America received 95% of enslaved people who arrived in the Americas, compared to less than 4% who were destined to North America. Available records show 9,371,001 individuals trafficked, but this documentation corresponds to only 88.5% of estimated vessels. And of the more than 10 million individuals embarked on slave ships in Africa, 5.8 million were victims of Brazilian and Portuguese traffickers and had Brazil as their destination.[2] Of the 9,930,478 people registered in the 1872 Census, 1,510,806 were still enslaved (22 years after prohibition of the slave trade) and 58% declared themselves descendants of slaves (Souza, 2013). In addition to this historical world record, Brazil has another: it was the last country in the world to "officially" abolish slavery (Motta, 1994; Florentino, 2009, p.28-33). These two records created and explain both the essence of racism and the unfathomable socioeconomic inequalities that consume us and make Brazil one of the most unequal countries in the world.

(2) The third record concerns our relations with the biosphere. No country or territory on the planet has at any time in human history destroyed nature as rapidly and devastatingly as have our dictators from

1970 onwards and, after them, our civilian governments. This article focuses on a brief analysis of this third record. It is enough, for now, to reaffirm that no country in the world compares with Brazil in terms of the intensity (scale/time ratio) of deforestation.

All the mobility and impasses of social classes or groups and all the major conflicts that have determined Brazil's historical dynamics before and after independence, as well as all forms of sensitivity and of understanding and reacting to these conflicts are given by these two structuring and, so to speak, "naturalized" features: slavery and the blitz to exterminate nature. A preliminary word on slavery: for almost four centuries of our history, the society created by colonizers and then by the local rulers consisted, in its vast majority, of enslaved people and slaveholders or those who benefited from slavery. Slavery is at the root of the lack of a sense of sharing among members of our society. Those at the top and bottom of the property and income pyramid do not see themselves as part of the same history and destiny. Brazil is the broadest historical realization of the Aristotelian concept of the slave "by nature". When discussing perverse constitutions and tyrannies in *Nicomachean Ethics* (1161a-b), Aristotle (n. d.) seems to describe a country that would come to exist more than two thousand years later, at least in the fundamental way of feeling of rich-white-males who consider themselves and are considered by the police and other institutions[3] to be the only subjects of the law:

> In the perverse forms of social formations [...], where there is nothing in common between ruler and ruled, there is also no friendship, because there is not even justice. It is like the craftsman's relationship with his tool, or the soul with the body (1161b), a master with his slave: all these instruments can be objects of care on the part of those who use them, but there is no friendship, nor justice in relation to inanimate things. Nor in relation to a horse or an ox, or to a slave, as a slave. In the latter case, the two parts have nothing in common: the slave is an animate tool, and the tool is an inanimate slave.

In this structural history of Brazil, slavery and destruction are, in short, the two "total social facts", that is, the two facts that "in some cases, put into motion the totality of society and its institutions" (Mauss, 1925).

Destruction: from the first to the second centenary

To begin with, it is worth remembering that 2022 marks the 20th anniversary of the publication of a milestone book in the history of the first centenary of this balance: *Um sopro de destruição* [A breath of destruction], by José Augusto Pádua (2002). Addressing this first centenary in the space of a brief article would be equivalent to reviewing this pioneering study, which has not had, to the best of our knowledge, major developments in the last 20 years. In the context of this 200-year historical overview, we must recall the accurate prophecy by José Bonifácio de Andrada e Silva (1763-1838), proffered in 1823, which Pádua rightly places in the epigraph of his seminal book:

> Nature has done everything for us, but we have done little or nothing for Nature. [...] Our precious forests are disappearing, victims of fire and the destructive axe, of ignorance and selfishness. Our hills and slopes are losing vegetation daily, and, with the passage of time, the fecund rains that favor vegetation and feed our springs and rivers will disappear; without them, our beautiful Brazil will be reduced to the arid lands and deserts of Libya in less than two centuries.

That prediction inspires this article's subtitle: after the two centuries foreseen by José Bonifácio and, above all, the four years of a devastating civil-military federal administration, what Brazil will we still have in the third centenary? I propose here a much more relevant question: what will remain of the country in this third decade of the 21st century? It is impossible to know precisely how far we still are from the "arid wastelands and deserts of Libya". What we know is that the time horizon in question is now decades because we have advanced in this direction in the second centenary, and especially in the last 50 years, much more rapidly than between 1823 and 1922. The difference between the first centenary of independence and the second is basically the instruments: in the first, the axe and local fires; in the second, the immense fires and industrial machinery of extermination, chainsaws and tractors, massive logging chains (*correntão* in Portuguese), and aircraft that, like in Vietnam, lob agent orange and other organochlorine defoliants over the forest's living organism.[4] In other words, what distinguishes the past from the present is the incomparably greater scale and speed of destruction. It took more than two centuries to devastate the Atlantic Forest almost completely (originally 1.36 million km^2), but only 50 years (1970-2020) to completely remove, degrade, or disfigure more than 2.5 million km^2 of natural vegetation in Brazil: about 800,000 km^2 of the Brazilian Amazon rainforest have been totally destroyed since 1970; so many others were degraded (337,427 km^2 just between 1992 and 2014) (Matricardi et al., 2020, p.1378-82). Degradation, less perceived, profoundly affects the forest's ability to function as an ecosystem. As Antônio Donato Nobre points out: "Talking only about deforestation when we talk about destruction of the Amazon is what I call the great green lie. The loss of Amazon rainforest to date is much greater than the almost 20% deforestation mentioned in the media" (apud Costa, 2020). In the Cerrado, 45.6% of the three landscapes that constitute its 2 million km^2 – fields, savannas, and forests – were deforested or deeply anthropized, with 265,000 km^2 replaced by monoculture and pasture lands between 1985 and 2020, while much of the remaining 54.4% are very fragmented and degraded.[5] In addition, the Caatinga lost 150,000 km^2 of primary vegetation between 1985 and 2020, a reduction of 26.36% during that period, of which 112,000 km^2 were replaced with agriculture; in some of its areas the desertification process is clearly accelerating.[6]

Destruction of the Atlantic Forest, the case of São Paulo

The title of José Augusto Pádua's book – *A breath of destruction* – refers to a speech by Joaquim Nabuco, in 1883, when the Atlantic Forest, especially in

the Northeast, Minas Gerais, and Rio de Janeiro, already showed brutal marks of this destruction. The case of relatively late deforestation in the state of São Paulo has been well studied (Victor et al., 2005). Up to the beginning of the 19th century, 81.8% of the territory corresponding to the current borders of the state (248,209 km^2) was covered by forests. According to Millet (1946, apud Victor et al., 2005, p.12), in the mid-19th century, "it is estimated that 510,000 hectares of forests [5,100 km^2] had been sacrificed, with a greater concentration naturally in the Paraíba Valley". In 1886, the deforested area had grown to 28,000 km^2, so the forest cover area had decreased from 81.8% to 70.5%. In 1907, São Paulo had lost 59,600 km^2 and the forests then covered only 58% of the state's area. Let us see what happens in the 13 successive years in which "Modernism" is conceived in the lounges of São Paulo's farmers (Victor et al., 2005, p.22):

> In this interval of almost 13 years, the State was stripped of about 3,285,000 hectares of forest [32,850 km2], in such a way that a vertical survey conducted in 1920 would show a tree cover percentage of about 45%, that is, 11,200,000 hectares [112,000 km2]. It is the tropical latifoliate forest that is being inexorably razed.

On November 15, 1923, in his famous letter to Tarsila do Amaral (2003, p.78-9, our translation), Mario de Andrade, then in Paris, exhorts her to return to Brazil: "Come to the virgin woods, where there is no black art, where there are also no gentle streams. There are VIRGIN WOODS. I created virgin--woodism. That is what the world, art, Brazil and my dearest Tarsila need". The writer certainly did not realize that about half of his "virgin woods" by then was already gone, and that in the 22 years of life he still had before him much more of it would disappear. The three succeeding decades effectively show an immense acceleration in this process of loss of the Atlantic Forest; if by 1920 the State had still conserved almost half of its native vegetation area (45%), only 32 years later, in 1952, forest cover had been reduced to 18.2% of the territory of São Paulo and 20 years ago, to about 3%.

According to the *Atlas of the Remnants of the Atlantic Forest 2019-2020*, now only 12.4% of native vegetation above three hectares remains of the entire biome in the 17 Brazilian states of the Atlantic Forest. In the 21st century (2000-2020), another 485,311 hectares (4,853 km^2) of native vegetation have been destroyed, which always increases the risks of collapse of ecosystem services – including water availability – on which 70% of the Brazilian population living in this territory depends.[7] The loss of species is another direct consequence of this process of forest extermination. A recent inventory of bird species, for example, carried out considering the latest versions of the Red List of Threatened Species (IUCN), concludes that in the Atlantic Forest (Develey; Phalan, 2021):

> [...] between five and seven bird species have probably been led to extinction in nature in this biome in recent decades, in addition to two other species that occurred in other parts of Brazil. These extinctions were the

result of habitat loss in combination with other threats. Nine other bird species of the Atlantic Forest are critically endangered, in addition to six from other parts of Brazil.

Worldwide, plant species endowed with seeds (spermatophytes) have become extinct since 1900 at the average rate of about three species per year, a rate up to 500 times higher than the base rate (extinction only by natural forces) (Ledford, 2019). However, the Atlantic Forest, in its southern portion, has lost between 21 and 30 species of this category of plants per year since 1900. Along with Western Australia and India, it is among the world's regions that have lost the most species of this category, being surpassed only by Hawaii and South Africa. Although later, the industrial character of deforestation in the Southeast during the second century of independence caused much greater impact on biodiversity than in the Northeast. Because it is much more rapid and devastating, it has deprived species of the most precious variable for their survival: the time required to adapt.

The last 50 years: the war of annihilation

A "Great Acceleration" in all parameters of anthropogenic interference in the Earth system began in the mid-20th century, as demonstrated since 2004 by the International Biosphere-Geosphere Program (IBGP) and subsequently by Will Steffen and colleagues (Steffen et al., 2015; McNeil; Engelke, 2014). In Brazil, the great acceleration of destruction was caused by the dictatorship instituted by the 1964 coup d'état, the period with the most crimes against humanity and against nature in the historical arc considered here. In 1967, the discovery of iron deposits in Carajás, in Southeastern Pará, was an omen of what was to come. Only three years later, having already neutralized democratic opposition through exile, arrests, torture, and murder, the military turned its weapons against central and northern Brazil's great biomes: the Pantanal, the Cerrado, and the Amazon, as well as against indigenous, riverine, and extractive communities. On October 9, 1970, Emílio Garrastazu Médici unveiled a supposedly self-commemorative plaque in the Amazon, which read: "On these banks of the Xingu, in the middle of the Amazon jungle, the President of the Republic has begun construction of the Trans-Amazonian, in a historic drive to conquer this gigantic green world". With the Trans-Amazonian highway, the opening of new mining fronts and predatory colonization, during the 1970s the dictatorship triggered the ecocide that is now resulting in ecological, and consequently socioeconomic, suicide in Brazil.

Ricardo Cardim (2020) analyzed and gathered textual and visual propaganda in support of destruction promoted by the dictatorship into an important collection. It is built upon the military rhetoric of a forest in the process of being "defeated". In this war propaganda, the Amazon, once destroyed, would afford fantastic business "opportunities". In November 1972, the Superintendency for the Development of Amazonia (Sudam), sponsored by the Ministry of the

Interior and Banco da Amazônia S.A., published the magazine *Isto é Amazônia*. One of its ads summed up the programmatic ideals of the alliance between the military regime and big capital:

> Enough of legends. Let's make money. Today, many people can take advantage of the Amazon's riches. With the applause and encouragement of SUDAM. Brazil is investing in the Amazon and offering profits to anyone who wants to participate in this enterprise. The Trans-Amazonian is there: the road to the gold mine. [...] There's a treasure waiting for you. Seize this opportunity. Make money.

The balance of this alliance between dictators and big capital is reasonably well known. In addition to the very rich photographic dossiers by Sebastião Salgado, Pedro Martinelli (2000), Araquém Alcântara[8], Carlos Carvalho[9], Rogério Assis (Araújo, 2018), and other great photographers of the Amazon, it has been well analyzed, be it by Rubens Valente (2017) in 2017, or in the chapter "Violations of Indigenous People's Human Rights" in the final report of the National Truth Commission (CNV). The CNV's pioneering survey managed to document a small part of the atrocities committed, emphasizing that the real number of indigenous people killed in the period "[m]ust be exponentially higher, since only a very limited portion of the indigenous peoples affected were analyzed and there are cases in which the number of dead is high enough to discourage estimates" (Brazil; Farias, 2014). As summarized by Kátia Brasil and Elaíze Farias (2014),

> During the period investigated [1964-1985], at least 8,350 indigenous people were killed in massacres, theft of their lands, forced removal from their territories, contagion by infectious-contagious diseases, arrest, torture, and abuse. Many suffered attempted extermination. [...] In larger number among the dead indigenous peoples we find 3,500 Cinta-Larga (RO), 2,650 Waimiri-Atroari (AM), 1,180 Tapayuna (MT), 354 Yanomami (AM/RR), 192 Xetá (PR), 176 Panará (MT), 118 Parakanã (PA), 85 Xavante from Marãiwatsédé (MT), 72 Araweté (PA), and more than 14 Arara (PA).

Regarding the destruction of the Amazon biome, extermination of the Amazon's fauna is worth mentioning. Ricardo Cardim (2020) cites a 1971 passage from the magazine *Realidade*:

> The great collective hunting of felines began in 1965, when about three dozen fur companies professionalized most of the men of the lower Xingu, Tocantins, and Tapajós as hunters. In 1970, adding exported skins lost through hunting and smuggling, it is estimated that 30,000 jaguars and 370,000 smaller felines were killed. [...] 1970 was a bad year for pelt sellers: they killed only 500,000 alligators.

Although not as accurate as measurements made since 1988 by INPE satellites, estimates of annihilation of the Amazon rainforest by our tyrants show

numbers higher than those occurring at any other time in its history, including today: about 21,000 km² per year on average between the end of 1970 and 1987, resulting in the total loss of 355,430 km² in this period of only 17 years, that is, almost half of all the loss in 50 years (1970-2020). In the 1978-1987 period, 211,300 km² of native forests were destroyed, an area larger than that of the state of Paraná (199,315 km²), as shown in Table 1.

Table 1 – Slash-And-Burn Deforestation of the Amazon Rainforest Between 1970 and 1987

Períod	Remaining territory covered by forest in the Brazilian Amazon (km²)	Annual slash-and-burn deforestation (km²)	Percentage of remaining forest in 1970	Forest loss since 1970
Pre-1970	4.100.000	--	--	--
1977	3.955.870	21.130	96,5%	144.130
1978-1987	3.744.570	21.130	91,3%	355.430

Source: Rhett A. Butler, "Calculating Deforestation Figures for the Amazon". *Mongabay*, Apr 24, 2018, based on INPE data. Available at: <https://rainforests.mongabay.com/amazon/deforestation_calculations.html>.

In only three years – 1988, 1995, and 2004 – did deforestation in the Amazon show numbers equal to or greater than the annual average of 21,000 km² in the 1970-1987 period. Thus, the military remains the major culprit for the destruction of almost 10% of the Brazilian part of the world's largest tropical forest.

After the forest was assaulted and the dictatorship ended, successive civilian governments continued that destruction. In 1985, according to the MapBiomas Project[10], Brazil as a whole still had a magnificent 4,812,286 km² of forest formations. In 2017, these formations had been reduced to 4,256,883 km², a loss through slash-and-burn deforestation, therefore, of 555,403 km². The ridiculous geopolitical phantasmagorias – "integrate so as not to forfeit" –, so dear to the uniformed minds, were no longer necessary. The goal now was to disintegrate the forest to integrate the Amazon and Cerrado into the *commodity* circuit of the globalized food system that had been expanding since the 1980s. Soybeans, certainly, but especially livestock: of the 555,400 km² deforested between 1985 and 2017, of which 462,700 km² were deforested to make way for pastureland, most of which, today, is very degraded. No less than 84% of the total deforestation area in this period became pastureland to make way for a cattle herd that is now larger than the country's human population; it doubled in the Midwest and grew tenfold in the Amazon between 1985 and 2016. Thus, due to the opening of pasturelands, deforestation rates remain extremely high, such

that since 1986, with the exception of 2009-2018, deforestation in the Amazon has never been less than 10,000 km² in the 12 months between August and July of the following year. There was an encouraging decrease in Amazon deforestation between 2005 and 2012. In 2010, with the regulation of the National Policy on Climate Change (Law No. 12,187/2009), Brazil established a primary goal of reducing greenhouse gas emissions, which was supposed to, as written in the law, reduce deforestation in the Amazon by 80% in 2020 compared to the average for the period of 1996-2005 (17,684 km²).

The truce or, rather, agribusiness's low-intensity war against the forest and its people lasted for a short time. Hostilities increased with Dilma Rousseff's capitulation to the ruralists castled in the National Congress. Her alliance with Kátia Abreu (president of the Brazilian Confederation of Agriculture and Livestock and, from 2014, minister of Agriculture) and Aldo Rebelo, rapporteur of the project to reformulate the Forest Code (2010), was enshrined in law in 2012.[11] The new code forgave fines applied until July 22, 2008 for illegal deforestation in preservation and reserve areas, which meant a waiver of about R$ 10 billion in funds that would otherwise have gone into public coffers, as then Minister of the Environment, Isabella Teixeira (Bresciani, 2010) protested in vain. In 2014, Brazil's failure to adhere to the "New York Declaration on Forests", in which more than 200 signatories proposed to halve global deforestation by 2020 and eradicate it by 2030, gave yet another sign of the Amazon's final abandonment to agribusiness. Deforestation, as expected, had grown again since 2013. In the six-year period between August 2012 and July 2018, the accumulated loss by slash-and-burn deforestation of the Brazilian Amazon rainforest reached 39,576 km². An area of Amazon rainforest almost the size of the state of Rio de Janeiro (43,750 km²) had become smoke in the blink of an eye! However, something far, far worse was to come. While the annual average deforestation in these six years was 6,596 km², it would surpass 10,000 km² in the first year of the Bolsonaro government, reaching 13,235 km² between August 2020 and July 2021. Far from being the result of a capitulation to agribusiness, the destruction of the forest occupies the heart of Bolsonaro's agenda, which is why forest loss reached 20,980 km² between August 2018 and July 2020. If this pace of devastation of more than 10,000 km² per year is maintained, in 2022 we will reach a loss of the Amazon rainforest of an area equivalent to that of the state of Santa Catarina (95,346 km²) just since 2010. It will possibly be greater because the last five years (2017-2021) have been marked by successive expansions, culminating in a 7.13% increase in Amazon deforestation in 2020, compared to 2019. Everything suggests that deforestation's upward trajectory will continue in 2022, including because the expectation that Bolsonaro will not be re-elected should lead the agribusiness sector to fear the resurgence of a minimum of governance and, therefore, we will see an unrestrained race to deforest in a typical "fait accompli" tactic. Something similar occurred, moreover, during the Lula administration's first year.

More fires, less water and collapse of biodiversity

Deforestation, forest degradation, and fires are complementary and synergistic processes of forest destruction and its replacement with monoculture and pastureland (Barlow et al., 2019, p.319-21). The increase in the intensity, frequency, and geographical coverage of fires in Brazil results from action by agribusiness, such as the so-called "Fire Day", a coordinated initiative by farmers in Novo Progresso (PA), that, according to INPE, caused a sudden increase of 300% in hot spots on August 10, 2019. This was not an isolated episode. The fires that occurred in 2020 and 2021 in the Pantanal, for example, were also coordinated by farmers (Ribeiro, 2020). As the Socio-environmental Institute rightly states, "Fire Day" has not ended since then (Aragão, 2021). But, alongside this direct and main cause, two systemic factors make the forest more vulnerable to fire and act as feedback loops for the destruction and degradation of forest's tapestry: the increasing droughts of 2005, 2010 and 2015/16 in the Amazon (Barkhrdarian et al., 2019; Jimenez et al., 2015: A Cloud Cover Perspective) and global warming. According to the MapBiomas Fire Project, between 1985 and 2020, fire had at least once already impacted 1,672,142 km², or almost 1/5 (19.6%) of Brazil's territory, and every year, during these 36 years, it destroyed, on average, an area larger than England: 150,957 km². The Cerrado and the Amazon represent 85% of the area burned in that period. Here, in this haunting situation, is the most striking aspect: almost two-thirds of the burned area in these three and a half decades, more precisely 65%, were covered by native vegetation. Ane Alencar, coordinator of MapBiomas Fire, underlines a fundamental distinction regarding the different impacts of fires in the Amazon and the Cerrado: "The Amazon is not a biome in which fire is part of the ecosystem's natural dynamics, unlike the Cerrado where natural fire is part of its evolutionary dynamics".[12] Carlos Nobre recalls that "when the forest is not disturbed, only 4% of solar radiation reaches the surface. Thus, it is very humid, and fire does not spread. In degraded areas, solar radiation penetrates and dries the forest floor. When fire arrives, it travels for miles through the degraded forest floor and countless trees die" (Betim, 2021). According to Bernardo Flores, fires in the Amazon rainforest destroy 60% to 90% of the trees. Their impact on the forest's regeneration capacity is increasingly irreversible, especially in floodable forests, called igapó or igarapé forests, which are even less resilient than dryland forests. As observed by Flores (Arantes, 2021; Flores; Holgren, 2021):

> This degradation of the forest along the so-called "deforestation arc" continues to occur and is very worrisome. But we have found that, in addition to it, there is also a savannization process13 in the heart of the Amazon, far from the agricultural frontier. [...] Our research has shown that native savannas are expanding and can expand further in the Amazon. Not along the "deforestation arc", where exotic grasses are spreading, but rather from white sand savannah patches scattered throughout the watershed, in remote regions.

According to the MapBiomas Project, in the 21st century alone (2000-2019), 17.5% of the country's area has already been victimized by fires. The Pantanal has had 57% of its total area burned; the Cerrado, 41%; and the areas supposedly protected by law, 18%. The Amazon as a whole has had 28.7% of its total area destroyed or degraded by the fire from unpunished criminals, who, encouraged by Bolsonaro, increasingly invade indigenous territories.

One of the effects of the deforestation, of the increase in surfaces disturbed and destroyed by fire, and of the increasing droughts that have been affecting the Amazon is the decrease in water-covered surfaces. According to Carlos Souza Jr. et al.: "There is a general downward trend in surface waters in the Amazon biome and in the stages of the river basins, suggesting a potential connection with more recent extreme droughts in the 2010s".[14] The MapBiomas Water Project, coordinated by Carlos Souza Jr. (Imazon) and by WWF-Brazil, has shown a 15.7% reduction in water surface in Brazil, which dropped from 197,000 km² in 1991 to 166,000 km² in 2020. In order to illustrate what this loss means in 30 years, it "equals one and a half times the water surface of the entire Northeast region in 2020".[15] All Brazilian biomes lost water surface. The Amazon lost 10.4% and the Caatinga, 17.5%. These are immense losses, but are seemingly less significant when compared to the terminal numbers from the Pantanal: a 68% loss of its water-covered surface in just 30 years!

There are already many perceived consequences of these vectors of destruction in Brazil. The eastern, southern, and southeastern portions of the Amazon rainforest are already dying, and wide stretches of the forest are at the limit of their resilience, as the humidity and integrity conditions that enable their existence are increasingly precarious (Lovejoy; Nobre, 2018; 2019; Gatti et al., 2021). If the current trajectory is maintained, in this second quarter of the century a gigantic forest *dieback*, an irreversible loss of up to 70% of the Amazon rainforest, may occur.[16] Catastrophic biodiversity losses are occurring before our eyes. In 2014, according to the IBGE, the country (considered in 1988 the most exuberant for endemic species among the planet's 17 megadiverse countries[17]) accounted for 3,299 species at risk of extinction, or 19.8% of the total of 16,645 species evaluated (Campos, 2020). Preliminary results show that fires in about 40,000 km², caused by farmers and ranchers, just in the Pantanal and only between January and November 2020, caused the immediate death by calcination of 17 million vertebrates (Ito, 2021). The successive deaths of fauna due to habitat loss have not yet been estimated but should not be less. "In tropical communities, 94% of plants are pollinated by animals" [18] and all the above destruction vectors, to which air pollution and increased use of pesticides by agribusiness should be added, are causing a dramatic decline in pollinators in Brazil. Affecting these factors, climate change should cause "a decline in agricultural pollinators in approximately 90% of municipalities in Brazil over the century."

Conclusion

The question formulated at the beginning of this text about what will remain of Brazil after 2022 and throughout this third decade of the twenty-first century can be answered in the form of two certainties: 1. Brazil is advancing rapidly along a trajectory of irreversible loss of what is left of its forests and other vegetation cover; 2. Brazil's inhabitability, that is, its climate, rainfall, salubriousness, and food and water security, depends to a large extent on its ability to *immediately* cease this destruction and move on to the restoration of what can still be restored. The ongoing destruction of what remains of these four biomes that are very rich in biodiversity – the Amazon, Cerrado, Pantanal, and Caatinga – will actually affect the planet as a whole. Loss of the Amazon is sure to have the greatest repercussion on a global scale. "The Amazon is fundamental to the planet's ecological balance", reasserts Carlos Nobre (2020). In fact, the world's largest tropical forest is a critical element of the Earth system and its interactions with other critical elements of this system are of immense importance for the balance of the global climate system (Lenton et al., 2008; Steffen et al., 2018). The Mediterranean, the United States and Brazil's North-Central region will undergo an average warming of 2°C above the industrial period by 2030, that is, ahead of the global average (Seneviratne et al., 2016). And this, in Brazil, in any scenario of greenhouse gas emissions, as shown by Carlos A. Nobre, José A. Marengo and Wagner R. Soares, authors of a reference book on the future climate in our country.[19]

The decade that opens with our Bicentennial of Independence will be decisive. The biological pillars of life in Brazil are increasingly more vulnerable and are very likely to collapse if Brazil condemns itself to another four years of civil-military federal administration. However, even in a scenario free of Bolsonaro, reversing the ongoing socio-environmental collapse process will require a radical inflection in the post-2022 trajectory, which unfortunately has not yet been proposed by any Brazilian political party. Society is responsible for imposing on the political system, agribusiness, and dominant economic thought the perception that economics is a subsystem of ecology and that the latter will impose its limits on it from now on. The sooner we recognize this, the less traumatic will be the future degrowth to which we are already, in any case, condemned. Without this inflection in trajectory, without a war effort to restore forests and other degraded biomes, reduce greenhouse gas emissions, suppress "agrocrime", and courageously reduce social inequalities, we will have, in a very conservative estimate, no more than a quarter century, in fact perhaps not even ten years of a still minimally organized society. Carlos Nobre, José Marengo, and Wagner Soares open the Preface to their aforementioned *Climate Change Risks in Brazil* with the following statement: "In a scenario of high greenhouse gas emissions, the country has a high probability (more than 70%) of suffering a temperature increase above 4°C before the end of the century". Already today, during the dry season, the Amazon and the Cerrado are 3°C and 4°C warmer,

respectively, than in the 1960s (Zorzetto, 2021, p.52-7). With warming levels above 2°C in the Brazilian annual average, expected for some time around 2030, feedback loops of warming and loss of biodiversity may further raise the country's average temperatures, recurrently causing much more intense droughts and heat peaks above organisms' thermal regulation capacity. Brazil will then show today's youth much more gloomy socio-environmental features than those predicted by José Bonifácio de Andrada e Silva two centuries ago.

Notes

1 I refer here to my essay "The Legacy of Slavery and Environmental Suicide" (Marques, 2012, p.163-9).

2 Cf. *SlaveVoyages*, Introductory maps. Available at: <https://www.slavevoyages. org/voyage/maps#introductory->.

3 Cf. "Chefe da Rota diz que PM deve tratar pobres e ricos de formas diferentes". *Pragmatismo político*, 24 ago. 2017.

4 Cf. Pinheiro (1989); Brasil (2011); "Fazendeiros estão usando o Agente Laranja para desmatar a Amazônia". *Mongabay.com*, 5 October 2011; Carvalho (2011); "Operação desarticula quadrilha de desmatadores que movimentou R$ 1,9 bilhão no Pará". Ibama, 30 June 2016: "Há a suspeita de que a organização criminosa tenha utilizado aviões agrícolas para sobrevoar as áreas invadidas e lançar coquetéis molotov e herbicidas desfolhantes semelhantes ao agente laranja".

5 Cf. Projeto MapBiomas, "Mapeamento Anual da Cobertura e Uso da Terra no Brasil (1985-2020). Destaques Cerrado". September 2021

6 Cf. Projeto MapBiomas, "Mapeamento Anual da Cobertura e Uso da Terra no Brasil (1985-2020). Destaques Caatinga". October 2021

7 Cf. SOS Mata Atlântica, INPE, *Atlas dos Remanescentes Florestais da Mata Atlântica. Período 2019-2020. Relatório Técnico*. São Paulo, 2021, p.8 e 43.

8 Cf. "Fotos de Araquém Alcântara denunciam a destruição da Amazônia". *Hora do Povo*, 22 August 2019.

9 See: <https://carloscarvalho.fot.br/sobre-o-autor/>.

10 Cf. Mapbiomas.org (2019). Available at: <http://mapbiomas.org/map#cove- rage>.

11 Cf. Law No. 12,651 of May 25, 2012, amended by Law No. 12,727 of 17 October 2012 and regulated by Decree No. 7,830 of 17 October 2012. Available at: <https://www.embrapa.br/codigo-florestal/entenda-o-codigo-florestal>.

12 Cf. "A cada ano, Brasil queima área maior que a Inglaterra". MapBiomas (Coleção 6). Available at: <https://mapbiomas.org/a-cada-ano-brasil-queima-area-maior-que--a--inglaterra>.

13 The term "savannization", in the sense used here, does not mean transition from forest to a biome whose biodiversity is comparable to the magnificence of the Cerrado. It, rather, refers to the replacement of the forest with a landscape that is terribly impoverished in all the so-called "ecosystem services" that a forest has the unique and irreplaceable ability to provide to the biosphere and in general to the Earth system's stability.

14 Cf. Souza Jr. et al. (2019): "*there is an overall trend of reducing surface water in the Amazon Biome and watershed scales, suggesting a potential connection to more recent extreme droughts in the 2010s*".

15 Cf. Projeto MapBiomas Água, "Superfície de água no Brasil reduz 15% desde o início dos anos 1990". See MapBiomas Água, "A dinâmica da superfície de água do território brasileiro", August 2021. Available at: <https://mapbiomas-br-site. s3.amazonaws. com/MapBiomas_A%CC%81gua_Agosto_2021_22082021_OK_ v2.pdf>.

16 Cf. Carlos Nobre, "Está a Amazônia próxima de um ponto de não retorno? 17 July 2020 Available at: <https://www.youtube.com/watch?v=cg5Rh5CVm48>.

17 Cf. Mittermeyer, 1988, chapter 16; Mittermeier; Robles, 1999; "Biodiversity A-Z". UNEP/WCMC. Available at: <https://www.biodiversitya-z.org/content/megadiverse-countries.pdf>.

18 Cf. Plataforma Brasileira de Biodiversidade e Serviços Ecossistêmicos (BPBES) e Rede Brasileira de Interações Planta-Polinizador (REBIPP), *Relatório Temático sobre Polinização, Polinizadores e Produção de Alimentos no Brasil*, 2018.

19 Cf. Nobre et al. 2020. See in particular Chapter2: Wagner Soares, José Marengo, Carlos Nobre, "Assessment of Warming Projections and Probabilities for Brazil", Figure 2.2.

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ABSTRACT – Two structural features constitute the history of Brazil over the last two centuries: slavery and its legacy in human relations, and destruction of the relations between humans, the natural landscape, and other species. This essay analyzes the latter structural feature of Brazilian society. The speech delivered in 1823 by José Bonifácio de Andrada e Silva marks the starting point of a process that would only deteriorate. After 200 years of destruction, three things are evident: 1. After 50 years (1970-2020) of destruction and degradation of over 2 million km² of biomes, Brazilian society is moving towards an unprecedented environmental catastrophe; 2. This development has accelerated during the last decade; and 3. Multiple indicators enable us to assert that we are already in the early stages of this collapse.

KEYWORDS: Deforestation, Loss of biodiversity, Atlantic Forest, Amazon, Cerrado, Environmental collapse.

RESUMO – Duas constantes atravessam nossa história nos dois últimos séculos: a escravidão e seu legado nas relações entre os humanos, e a destruição nas relações dos humanos com a paisagem natural e com as outras espécies. O presente artigo atém-se a uma breve análise desse segundo traço estruturante da sociedade brasileira. O discurso proferido em 1823 por José Bonifácio de Andrada e Silva assinala o ponto de partida de um processo que só viria desde então a se agravar. Após 200 anos de destruição, três evidências se acumulam: 1- após 50 anos (1970-2020) de destruição e degradação de mais de 2 milhões de km² dos biomas nacionais, a sociedade brasileira avança na direção de uma catástrofe ambiental sem precedentes em nossa história; 2- esse avanço se acelerou no último decênio; e 3- múltiplos indicadores permitem afirmar que já estamos nos estágios iniciais desse colapso.

PALAVRAS-CHAVES: Desmatamento, Perda de biodiversidade, Mata Atlântica, Amazônia, Cerrado, Colapso ambiental.

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