

Complex Figurations at Risk. Perspectives for Human and Non-Human Inhabitants of the Amazon.

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Abstract: The climate crisis is affecting the Amazon. River droughts and intense heat have an impact on humans and non-humans alike. Commodities, deforestation, selective logging, the use of fire and environmental degradation trigger anthropogenic effects in the Amazon. This essay aims at highlighting the consequences of this development for the future of humans and non-humans in the Amazon and beyond. It argues for the expansion of institutions of climate governance – in particular, carbon trading – to those who live in and from the forest. The analysis is based on fieldwork and applies a bibliographical as well as documentary approach. Its main framework is figurational sociology. In its last section this contribution sketches concrete interventions to shield the communities of the Amazon hinterland from social figurations appropriating the land for deforestation; these comprise valuing spontaneous actions and ethno-knowledge, creating experimental fields in the *terra firme* and *várzea* communities to form germplasm and seed banks, shielding communities from actors that compromise the balance of the ecosystem, providing better living conditions for Amazonians, and enhancing the environment for the life of non-humans.

Zusammenfassung: Die Klimakrise trifft den Amazonas. Die Austrocknung des Flusses und die intensive Hitze wirken sich auf Menschen wie Tiere aus. Rohstoffgewinnung, Abholzung, selektiver Holzeinschlag, Brandrodung und Umweltzerstörung haben vor Ort massive Auswirkungen. Dieses Essay möchte auf die Folgen dieser Entwicklung für die Zukunft der Menschen und Nicht-Menschen im Amazonasgebiet und darüber hinaus aufmerksam machen und argumentiert für eine Ausweitung der Klimaschutzinstitutionen – insbesondere den Handel mit Kohlenstoffzertifikaten – auf die Menschen, die im und vom Wald leben. Die dem Text zugrundeliegende Forschung ist bibliografisch, dokumentarisch und basiert auf Feldforschung sowie einem figurationssoziologischen Ansatz. Der Beitrag skizziert im letzten Teil konkrete Interventionen zum Schutz der Gemeinden im Amazonasgebiet vor Unternehmen, die unrechtmäßig Land für die Abholzung in Besitz nehmen. Dies umfasst die Wertschätzung lokaler Wissens- und Praxisformen, die Schaffung von Versuchsfeldern in den Gemeinden des Festlands und in den Auen, um Keimplasma- und Saatgutbanken aufzubauen, den Schutz der Gemeinden vor Akteuren, die das Gleichgewicht des Ökosystems gefährden, und die Verbesserung der Lebensbedingungen von menschlichen und nicht-menschlichen Bewohner*innen Amazoniens.

Keywords: figuration; climate crisis; Amazon hinterland; non-humans.

Introduction

The long-term anthropogenic effects – resulting not from the use of fossil fuels but also the damages caused to ecosystems and the biosphere – have triggered the climate crisis. Mitigation of global warming is a concern that was already raised in 1972 at the *United Nations Conference on the Human Environment* (UNCED). During the last decades at several Conference of the Parties (COPs) of the *United Nations Framework Convention on Climate Change* (UNFCCC), various agreements have been passed – such as the Kyoto Protocol in 1997 or the Paris Agreement in 2015 – in order to reduce Green House Gas (GHG) Emissions and mitigate the climate crisis. In the words of Norbert Elias (1994a: 102, translated by G.M.), ‘humans have achieved supremacy over non-humans, but over time, ...they have begun to realize that dominance over others implies some responsibility towards them’.

The documents and reports emerging from these conventions testify the necessity of long-term changes in behaviour, stance, etiquette, and shame regarding our human dealings with non-human beings. Regulatory mechanisms, policies, guidelines, research, and environmental technologies – when divested of dogmatism – constitute civilising forces. Based on the premise that

[...] civilization processes are considered a universal characteristic of human societies [...] Learning the skills of survival and passing them on to the next generation—this is what the process of civilization is about. It concerns the formation of behavior regimes that people impose on others and themselves, regimes that allow them, in a certain way, to face the problems they encounter in their lives and which are transmitted to one another’. (Goudsblom, 2001: 243, translated by G.M.)

Thus, it is expected that, in the short term, the set of norms should act from the outside in, and in the long term, from the inside, too, becoming part of the individual’s personality structure. This change enables to realise that the imbalance in biomes and ecosystems

is also affecting non-humans, and the collapse will be catastrophic, as they will not have time to adjust their DNA in the face of climate change, which has been consolidating due to a series of anthropogenic actions.

On a global scale, drawing upon personal pronouns as figurational models (Elias 1980), a self-analysis is essential to understand the impacts of war and military conflicts, including also the rise in global temperatures, as well as ecosystem imbalance, and environmental degradation, resulting in the deaths of thousands of non-humans. Tensions are escalating globally with the announced termination of the *Nuclear Non-Proliferation Treaty* between the USA and Russia. The example of the war in the Middle East reveals the destructive power of modern military on the environment. Toxic gases, heat emission, the accumulation of solid waste, and other damages are impacting the local ecosystem and contributing to global environmental crises. At the end of this war, humans will require excessive energy and a major onslaught on the environment for the appropriation of raw materials. Such tensions and conflicts express what Elias (1980: 171, translated by G.M.) designated within the triad of basic controls as the ‘greater or lesser range of possibilities for controlling interpersonal relationships—that is, social controls.’ The two other components of the triad concern the control of nature and self-control.

Faced with tensions and conflicts in interpersonal relationships, natural disasters, and anthropogenic actions, the *Svalbard Global Seed Vault* – a seed bank located in Norway – was established as a preventive measure for the future of humanity. The distinguishing feature of this seed vault was that it was constructed to withstand destruction. In contrast, tropical forests, such as the Amazon, which are in the open and encompass a potential bank of seeds, germplasm, and carbon sequestration vital to humanity and the maintenance of non-human life, are under grave risk from mechanisms of extermination. For the benefit of humans and non-humans, tropical rainforests such as the Amazon are a natural storehouse to be protected.

From the perspective of the triad of controls (Elias 1980), ‘the control of nature’ has its nuances: annihilation, safeguarding and coexistence. The first form has been harming the planet for humans. The other two must prevail in order to change the direction of the first, conceiving that the domination of nature is not just its plundering. In this way, self-restraint and social control go hand in hand with control of nature. For it is in functional interdependencies, on a global scale, that the climate crisis has been established by anthropogenic actions. If we don’t take on board this lesson left by Elias (1980, 1994b), discussions will get lost in the ‘black hole’, and the desired civilising of the environment will vanish alongside it. Within this analytical perspective, which encompasses both the global and the regional, the figuration of the climate crisis is, *par excellence*, complex; it has generated problems and demands long-term solutions. According to Norbert Elias (1980), complex figurations must be approached indirectly. Such a perspective reminds us of our responsibility to understand the causes – which are largely anthropogenic – in order to subsequently apply mechanisms that contribute to the mitigation of global warming. However, it is necessary to also warn of the reverse effect of climate change. Just as heat has been affecting cold regions, intense cold will affect both humans and non-humans in tropical regions, too.

Following the aforementioned digression, and understanding the climate crises as the outcome of the multiple actions of humans and their interdependencies, my reflections now converge on the theme of this essay: complex figurations of humans and non-humans of the Amazon and beyond.

The water cycle in the Amazon – the flooding and ebbing of the river – is a natural annual phenomenon. According to Matos (2015), Amazonian populations coexist with these cycles, developing socio-cultural practices in terrestrial and aquatic environments, such as hunting, fishing, plant-based extraction, domestic animal husbandry and soil cultivation, which involves cutting down the forest, burning, planting and harvesting.

At certain points in the cycle, optimal conditions sup-

port diverse extractive practices that benefit these populations, yet the same regularity that offers predictability also leaves them vulnerable to environmental collapse. If the cycle exceeds acceptable standards, damage to agricultural production, mobility and housing, among other obstacles, is inevitable. The *Geological Survey of Brazil*, which issues flood warnings to guide the population, points out the Amazon experienced its biggest floods in 2021 and 2023, followed by historic droughts and intense heat in 2023 and 2024, affecting humans and non-humans alike.

In January 2024, according to World Weather Attribution (2024) it was not *El Niño* that caused the drought in the Amazon basin, but climate change due to anthropogenic actions on a global scale. The WWA points out that river levels have not been lower for 120 years and that in the future, the intervals between major outflows will be shorter. Therefore, the Amazon River outflow, accompanied by intense heat, which occurred in 2023 and 2024, serves as a trigger warning, as an indicator of imbalance in the local ecosystem and the biosphere.

The event indicated the vulnerability of nature’s stability and served as a warning for the future. Both the ebbs and floods and the high temperatures will complicate the social organisation of those who live in the Amazon and, by extension, non-humans. The unbalanced habitat will affect the reproduction, feeding patterns and reproduction of many terrestrial, aquatic and aerial species, affecting the livelihood of the hinterland, that depends on a stable ecosystem.

Amazonian communities have been impacted, facing difficulties in accessing drinking water and food, and in reaching their smallholding and fishing grounds. At least 43 towns were declared under a state of emergency. The mass death of fish, widely reported by the media and social networks, caused public concern.

Observed phenomena and research findings indicate an imminent risk to the inhabitants of the Amazon – humans and non-humans – due to environmental collapse. This essay seeks to highlight these future scenarios for humans and non-humans in the Amazon and beyond; but also, to advocate for an enhancement of institutions for those who live in and

from the forest. Based on fieldwork within rural communities in municipalities of the state of Amazonas, located in the Middle Amazon Basin, the Central Amazon Mesoregion and the Parintins Microregion, the article provides concrete proposals for improvement.

1. Hitherto Developments and Human Expansion in the Amazonian Hinterland

Even in historic droughts, the Amazon River has remained navigable by large cargo ships supplying Manaus's trade, as well as by ferries and regional boats transporting cargo and passengers between northern states, their municipalities and rural communities. Should the balance of the rivers collapse, they will impose upon the inhabitants of Amazonas the need for alternative means of access beyond mere waterways. The construction of BR-319 highway (Manaus – Porto Velho) is viewed as necessary, as it provides access to the country's major highway networks. At the same time, these plans fuel debates surrounding its environmental impacts. In the case of the Amazonian hinterland, severe river ebbs have sparked discussions – environmental concerns notwithstanding – regarding the opening of forest access routes and roads between municipalities and river ports capable of docking vessels, which serve as the primary supply lifelines for the municipalities in Amazonas.

The collapse of the Amazon basin will be disastrous for non-human species, because their DNA, rigid by nature (Elias 2009), does not change quickly enough to keep pace with abrupt changes. This has already happened to the multitude of fish – *acará*, *tucunaré*, *aruanã*, *traíra*, *jacundá*, *bodó*, *tamuatá*, among others – that did not migrate from the lakes and died by the thousands. Whereas humans, with a rich heritage of knowledge, can adjust to temperature variations, if only to a certain extent. What does the phenomenon teach us? That nature, with or without humans, takes its course without asking permission. If one species goes extinct, another may emerge, or none at all. In its irrationality and lack of objectivity, this is of no

consequence to it. In a natural process, the natural world never ceases to evolve.

Elias (1980) asserts that there was no genetic mutation in the human species in its social development. In its blind process, nature endowed humans with biologically differentiated qualities, which constituted their unique position through continual learning (Elias 2009), enabling them to survive in a wide variety of geographical environments, with different climates, biomes and ecosystems, making them the primary invasive species causing devastating impacts on various ecosystems. In the face of environmental disruption, the fluidity of culture enables refinement in human's relationship with the natural environment. Wilterdink (2024) points out that the human species has been so successful in terms of survival, reproduction and dominance as a result of the evolution that led it to *Homo sapiens* and the way it spread across the Earth. Thus, 'the key is the human capacity to adapt through innovation and social learning – in short, through culture' (Wilterdink 2024: 64, translated by G.M.).

Environment collapses due to the climate crisis pose an imminent risk for the population of the Amazon. According to data of the *Instituto Brasileiro de Geografia e Estatística* (IBGE), the rural and urban population of Amazonas in 2010 was 3,551,196, and by 2025 it is projected to reach 4,321,616. Three factors have driven this expansion: adaptation to the hot and humid climate, knowledge inherited from the ecological regime, and, more recently, public policies. According to Matos (2015), adaptation helps explain human permanence and expansion in the Amazon. The inhabitants, adapted to the hot and humid climate, develop their socio-cultural practices and adjust to ecological pressures. Adaptation may take the form of acclimatisation, developmental adaptation, and cultural adjustments (Stini 1975, McElroy/Townsend 1979, Moran 1994, cited in Matos 2015). In summary, acclimatisation is a short-term, reversible adaptation; developmental adaptation occurs over a long period and accompanies the individual's growth and development (Moran 1994, McElroy/Townsend 1979, cited in Matos 2015). The organism molds itself

to the demands of the environment. In the case of the inhabitants of the Amazon, they benefit from ontogenetic adjustments, which give them natural advantages in the environment. However, it is cultural adjustments that contribute most to human expansion, enabling both inhabitants and outsiders to establish homes, work, and use natural resources.

The ecological regime concerns the *modus vivendi* of the indigenous peoples of the Amazon prior to the arrival of invaders and its continuity after contact. In this regime, human groups face ecological pressures, including climate instability. In the Amazon hinterland, although there have been improvements in quality of life, the precepts of the ecological regime remain part of daily life. Therefore, ecosystem collapse will affect ecological relationships – terrestrial, aquatic, and aerial – and will have severe consequences for humans, too.

The ecological regime is based on the centuries-old knowledge – ethno-knowledge – of the indigenous peoples of the Amazon, which has been incorporated by Western society, contributing to human expansion in the region: a) secular knowledge of the flora, regarding fruiting, resistance, durability, and utility for building boats, houses, fences, and more, b) knowledge of the terrestrial, aquatic, and avian fauna of the whitewater and blackwater rivers of the Amazon, regarding behaviour, relation to the water cycles – flooding and ebbing – reproductive period, habitat, and diet, as well as of the *terra firme* and *várzea* forests, their habitats, feeding habits, and behaviours, giving us significant advantages over them, especially in their capture, and c) knowledge of the technique of shifting cultivation through forest clearing and burning for manioc cultivation.

These forms of knowledge were assimilated by the invaders when they reached the ‘New World’ in 1500 and, a century thereafter, in the Amazon. This marks the beginning of the Western civilising process over the indigenous peoples of the region (Matos 2023). Westerners, asserting their superiority, denied the cosmogony and cosmology of the indigenous peoples, and a utilitarian and functional conception of the environment prevailed. With experiences

brought from the ‘Old World’ and new technologies, the invaders surpassed the civilisations of the Amazon in their capacity to exploit nature and cause major impacts, supported by transoceanic networks of functional interdependencies.

Population growth in the Amazon is also due to current government programs that serve low-income families in the state capital and in rural areas. However, these fundings are not permanent; should they cease to be implemented, they could leave many families vulnerable. The *Bolsa Família* program (Conditional Cash Transfer – CCT), the *Pé-de-meia* savings program, and the *Seguro Defeso* closed-season insurance program provide income transfers. The *Siga Antenado* program distributes satellite dishes to families. The *Luz Para Todos* (Light for All) program has given Amazonian populations access to continuous electricity, and thus, improving the quality of life. Solar energy harvesting has also become a reality across various communities. This has led to increased energy use (Goudsblom 2014) and greater mechanisation (Elias 2006). Families have bought refrigerators and freezers, enabling them to store food longer and reduce the use of brine. Electric machines and household appliances are now part of daily life: drills, planers, saws, water pumps, blenders, bread makers, washing machines, among others.

This triad – adaptation, government programs, and knowledge derived from the ecological regime – has enabled the hinterland population, confident in long-term climate stability, to expand into the headwaters of rivers, lakes, streams, and the banks of large rivers, cultivating the land, raising animals, utilising natural resources, accumulating goods, and appropriating vacant land. In this expansionist drive, they have experienced the ecological pressure of the historical flood ebb cycle of the Amazon basin and will also be impacted if the environment collapses. However, to a greater degree and intensity, non-human species have suffered from the results and will be most affected if ecosystem imbalance is not contained. Climate change and its impacts on the Amazon (Marengo/Souza Jr. 2018), based on complex climate model simulations, indicate that regional temperatures will

rise, rainfall will decrease, the dry season will lengthen, and South America will be the continent most at risk of species extinction.

2. Outdated Conceptions in New Times of a Changing Amazon

The above reflections question outdated economic conceptions – such as the belief that forested land is worthless than deforested land. These ideas have largely benefited companies, corporations, and entrepreneurs who have acquired large tracts of densely forested land, which have then been cleared for cattle ranching and other purposes. The sequestration of carbon and other greenhouse gases occurs within the standing forest, adding further value to it. This definitively alters the old paradigm, elevating the forest's role to a new status: land with a standing forest is worth more than deforested land.

Another outdated notion, upheld by government departments managing agrarian issues, posits that secondary forests, known as *capoeiras*, may be felled without restrictions. These forests are seen as 'useless' to humans because there is no perceived economic benefit in harvesting their timber. On the contrary, in fact, they are vital habitats for non-human species, providing food and reproduction sites. If the forest is 20, 30 or more years old, it incorporates more medium- and large-sized tree species and the ecological relationships intensify. *Açaí, tucumã, inajá, pirima, bacaba, marajá, babaçu, goiaba de anta, pepino do mato, sorvinha, mari, cumarú, andiroba, piquiá, cupiúba, morototó, marupá, castanha amazônica, jatobá, muruxi, ingá xixi, jutai pororo*, as they bear fruit, attract a diversity of terrestrial and avian species. Toucans, guans, curassows, thrushes, agoutis, deer, pacas, monkeys and bats, as they feed, contribute to seed dispersal. In the Amazon, there are hundreds or thousands of hectares of *capoeira* (secondary forest) which, in times of climate crisis, must shed the derogatory and misguided conception associated with it and be recognised for its role in ecological relationships, the biome, and the ecosystem, of which humans are a part.

Matos (2023), in studying the Western civilising process in the Amazon, identifies in the writings of the travelers who entered the region – Father Gaspar Carvajal in 1542, Father Cristobal d'Acuña in 1639, and Father Samuel Fritz in 1689 – records of large indigenous populations inhabiting the banks of the Amazon River and its tributaries, forest after forest. There were no fewer than 8,000 to 10,000 indigenous people inhabiting the great plains. Father Fritz denounced the Portuguese for capturing and enslaving these peoples. As they fled, indigenous groups took refuge at the headwaters of rivers, abandoned their villages, and settled in new areas. These areas, once inhabited and cultivated, were spontaneously sown by fruit seeds collected from the forest. Abandoned for centuries, they regenerated into forest and later became archaeological sites. Such sites were only discovered by non-indigenous people after forest clearing. Archaeologist Anna Roosevelt (Roosevelt 1992, Roosevelt/Navarro 2021) identifies human presence in the Amazon 13,000 years ago, as do studies by Neves (2012, 2021) and Schmidt (2012). Barreto et al. (2016), in *Cerâmicas Arqueológicas da Amazônia* (Archaeological Ceramics of the Amazon), record the indigenous occupation of the Amazon through large archaeological sites. As a legacy, they left *terra preta indígena* (TPI), or Amazonian dark earth (ADE), much coveted for agriculture. From the travelers to archaeological research (Moraes/Py-Daniel, 2023), it is clear that the Amazon was widely populated and its inhabitants undeniably contributed to seed dispersal and forest formation.

Capoeira, even today, is often undervalued despite the role it plays in the ecosystem. It perpetuates a static view in which no evolution occurs. On the contrary, it is necessary to understand the timelessness of nature in process, in order to conceive of the secondary forest – *capoeirão* – as a link, a bridge to the resumption of the great forest. Due to competing natural forces, and the search for light or positive phototropism, large trees gradually predominate in height, root systems, and canopy. Thus, what was once a village or town has been overtaken by the forest. Anthropogenic traces – Edge effects (De Barros 2006, Sampaio

2011) and long-term degradation have ceased.

3. On the Functional Role of the Amazon Rainforest for Humans and Non-Humans

The importance of the Amazon rainforest is presented well in *The climate future of Amazonia: scientific assessment report* (Nobre 2014: 4–6, translated by G.M.). In this report Nobre shows five important findings for Amazonian ecohydrology,

'a) [...] the forest keeps the moving air moist, which brings rainfall to continental areas far from the oceans; b) [...] the formation of abundant rainfall in clean air. The trees emit volatile substances that are precursors of water vapor condensation seeds, whose efficiency in nucleating clouds results in abundant and benign rainfall; c) [...] the Amazon rainforest's survival of climatic cataclysms and its formidable ability to sustain a beneficial hydrological cycle, even in unfavorable external conditions; d) [...] The Amazon rainforest not only keeps the air moist for itself, but also exports aerial rivers of vapor that carry water for the abundant rains that irrigate distant regions in the hemispheric summer; e) [...] the Amazon region and nearby oceans do not encourage the occurrence of atmospheric phenomena such as hurricanes and other extreme weather events.'

UNESCO has declared the Central Amazon Conservation Complex, comprising the *Jaú National Park*, the *Mamirauá* and *Amanã Sustainable Development Reserves* and the *Anavilhanas National Park*, a *World Heritage Site* covering more than five million hectares. Hidden forces, local, national, within and between continents, have contributed to deforestation, selective logging and environmental degradation in the Amazon. In the face of the climate crisis, there is a need to sensitise the global community to the importance of the standing forest, not restricted to protected areas, with the aim of reducing anthropogenic actions. Amazonian nature takes its course, whether humans protect it or not. As mentioned above, the triad of basic controls (Elias 1980) – control of nature,

social controls and self-restraint – allows us to allude that the control of nature by mechanical, physical, chemical or biological agents, in a unilateral way, has led, in the long term, to climate instability. Therefore, it can be argued that in order to make a change, environmental research and (re-)education is in need for incorporating the insight of a mutual interdependence between humans and non-humans.

In the Amazon, the unilateral way of dominating nature was a legacy left by the invaders, who appropriated the knowledge developed in the ecological regime by the indigenous people, denying their secular cosmovision and cosmogony. The gods, the beings and spirits that protected it, were denied and the environment was plundered. This way of conceiving the domain of nature was passed on to successive generations. This socio-cultural process refers to the second level of the civilising process discussed by Elias (1994) and Goudsblom (1995). Individual civilising process and global human history include the second level (social) and first level (individual) civilising processes. The connection between the triad of controls and the levels of the civilising process explains the path that has consolidated environmental degradation, while at the same time shedding light on civilisation/humanisation in relation to nature, with the aim of changing the direction of the process.

4. Complex Figurations: Interdependencies in the Amazon and Beyond

The concept of figuration express the idea that human beings live in a web of functional interdependencies: 'we can only understand many aspects of the behaviour or actions of individual people if we begin by studying the nature of their interdependence and the structure of their societies' (Elias 1980: 79, translated by G.M.). At the heart of figurations are power, knowledge, and emotions. A figuration can become opaque to many members of a society, depending on the objectives and goals that drive it. The power that constitutes it can silence individuals linked to the network through relationships of cronyism or perso-

nal ties. It can be illicit, as its means and ends violate institutionally established rules, such as the selective logging of timber.

Dismantling complex figurations requires greater state-level power. When the police carries out investigations, they apply the figurational method by connecting hidden links and identifying the networks that sustain schemes such as the illegal export of timber from the Amazon to the United States and Europe (Barreto 2006). Analysing the Amazon using statistical data, climate models or drones has its scientific merits. However, the figurational approach reveals initiatives that are external to the social relations of a community, which may be overlooked in statistical analyses or simulation models, yet have significant implications for ecological relations, the biome, the ecosystem, and, by extension, humans. From the air, utilising drones one can see land cleared for planting soybeans or pasture for cattle. However, it is difficult to detect from above the tree species – *pau-d'arco*, *itaúba*, *louro pedra*, *piquidá*, *jatobá*, *maracatiara*, *cedro*, *acariquara*, *cumaru*, among others – that have been, and continue to be, illegally removed from the forest, sustained by an invisible network of consumers operating within and across continents. This remains unrecognised and is not accounted for in the carbon market, which enables large-scale timber sales. Figurational analysis also reveals that beneficial initiatives are no longer valued, while harmful ones are perpetuated.

The production and trade of commodities are the foundation of the global economy. Commodities originating from the Amazon are essential raw materials for manufacturing many everyday commodities. They are also associated with deforestation in the *Legal Amazon*: the production of soy, beef, sugar cane, rice, coffee, and corn – monocultures with far-reaching consequences for the ecosystem. Unlike selective logging, the production of these commodities requires forest clearing to grow crops. In extensive farming systems, cattle ranching demands large areas of deforested land, and soybean cultivation has become one of the main economic activities driving deforestation in the Amazon (Rivero et al. 2009, Do-

mingues/Bermann 2012, Fearnside 2005).

5. Personal Pronouns as Figurational Models: Removing the Saints' Aureole and Wearing the Mantle of Mea Culpa

Personal pronouns involve the persons of discourse. They relate to the person speaking, the one being spoken to, and the one being spoken about. Norbert Elias masterfully employs personal pronouns for sociological analysis. Personal pronouns divest saints of their halos and place the label of *mea culpa* on even the most ignorant individuals – from the 'I' who writes, to the 'they' who read; from the highest ranks of scientists and intellectuals, to those with the least formal education; from the most powerful to the lowest economic class; from the most devout to the most skeptical, regardless of race or ethnicity.

Commodities stand at the centre – and as villains – of deforestation in the Amazon, but they do not have an independent existence. They underpin agribusiness, one of the main sectors of many national economies, and are present in the daily lives of all humans and non-humans. Let anyone who does not consume them cast the first stone. In functional interdependence, Matos (2022) emphasises personal pronouns in the analysis of environmental issues, mentioning soybeans and cattle ranching. Thus, when referring to the 'I', one

'...has to include the idea of other people who occupy other positions in the web of relationships to which the set of personal pronouns refers ... there cannot be an "I" without there being a "you", "he", "she", "we", "you" (plural), "they"' (Elias 1980: 135, translated by G.M.).

In this sense, we are the ones who drive the production of commodities – soy, corn, cattle, rice, sugar cane. We are domestic consumers, and they are consumers in other countries, the main importers of soy, beef, coffee, and wood from the Amazon rainforest.

Commodities are the result of long-term social pro-

cesses introduced to Brazil by Portuguese invaders. The ox, from the Iberian Peninsula and Cape Verde, was introduced after the ‘discovery’ of Brazil in 1533 and, by the 16th century, was already found in the Portuguese captaincies (Silva et al. 2012). Coffee, according to Carvalho (2007), from the East, arrived in Brazil in 1727 in the region of *Pará*, later spreading to other states. Sugar cane, from the islands of Madeira and the Azores, was introduced to Brazil in 1532 (Sobrinho et al. 2019) and later spread to other states. Soybeans, from China, were first recorded in Brazil in 1882, but it was in the 1940s that their economic production began, intensifying in the 1960s with government incentives (Gazzoni/Dall’Agno 2018) and reaching the Amazon around 1990 (Flexor et al. 2006). Soybeans have been extensively studied and adapted to the regions of Brazil. Their genetic material has been significantly modified through research conducted by government institutions – *Embrapa*, *IAC*, *Emgopa*, *Empaer*, the *Federal University of Viçosa*, among others (Gazzoni/Dall’Agno, 2018) – enabling their cultivation in the tropical regions of Brazil, including the Amazon.

Commodities are considered here as long-term social processes, which refer

‘[...] to broad and continuous long-term transformations, which can have the direction of rise and decline... If human beings stopped planning and acting, then there would be no social processes at all. The relative autonomy of social processes [...] results in long-lasting transformations in social coexistence, which no human being planned and which certainly no one predicted beforehand’ (Elias 2006: 31, translation and emphasis by G.M.).

In this perspective, an individual alone does not have the autonomy to change the direction of the process, implying that agribusiness will continue and environmental impacts will not cease. In the hidden network, it is we, the consumers, who set it in motion, requiring us to self-reflect and distance ourselves. The statements about the rise in the planet’s temperature are apocalyptic. Concepts developed by

Norbert Elias (1980) – figuration, personal pronouns as figurational models, and social process – challenge the ingrained conception of *homo clausus* in favour of *homines aperti*: changing the notion of a closed self, separate from society and nature, to a self with open valences, capable of establishing relationships and perceiving itself as a being like others, both biologically and socially constituted (Elias 1994a, 1994b, 2009).

Changing the direction of the process of environmental imbalance depends on global human society. This applies to the Amazon rainforest, as ‘the main importers of commodities that put pressure on the forest are the European Union, the United Kingdom, and the United States’ (Vieira et al. 2022: 3).

6. Findings and Implications of Empirical Research in the Field

The following section presents findings from own research on cattle ranching, logging, and sowers of ethno-knowledge. Field visits have been conducted in rural communities in the state of Amazonas, in the *Calha do Médio Amazonas* (Mid-Amazon Trough), the Mesoregion of Central Amazonas, and the Microregion of Parintins. Parts of this research have already been published in Matos 2015.

Cattle Ranching

Cattle ranching, one of the activities responsible for deforestation (Domingues/Bermann 2012, Fearnside 2005), is not exclusive to large cattle ranchers. Cattle and buffalo ranching in the Amazonas is on the rise with cattle herds growing by 80% (IBGE 2026a), and buffalo herds by almost 75% (IBGE 2026b) from 2020 to 2024.

The buffalo, native to Asia, has voracious feeding habits. In the Amazon ecosystem, they are observed grazing on dry land, along lakes, rivers, and river headwaters, significantly altering the aquatic landscape, a key factor in assessing whether there is potential impact to the biome. They can eliminate floating islands, self-contained biomes where there is

potential for dynamic ecological relationships (Matos 2015). In rural communities with a tradition of cattle ranching, the landscape of dry land, lakes, *igapó* forests, islands, and riverbanks has changed. The forest is cut down by mechanical means, as it ceases to be an ally – essential to the Amazonian *modus vivendi* – and becomes an obstacle to cattle farmers. This is an economic activity that families seek because of financial returns and social distinction. However, it negatively impacts subsistence activities: the forest, as a place for hunting and other uses, becomes more distant. In the *igapó* floodplains (flooded forests), breeding grounds and sources of food for fish, birds, and primates are compromised by deforestation and the uncontrolled use of fire (Matos 2015).

It is also essential to mention the large ranches found along federal and state highways, as well as their feeder roads, where enforcement is rarely present. Deforested tracts of 500 to 800 hectares, converted into cattle pasture, reveal the power of large-scale ranchers to clear the land using heavy machinery without the use of fire. According to Goudsblom (2002, cited in Matos 2015), from the beginning humans have used fire in two basic ways: hearth and torch. In the sense of torch – to cleanse, destroy, clear – fire is used in the Amazon (Matos 2015: 144 ff.). Goudsblom (1992: 4 f.) attributes four characteristics to fire:

'It is destructive. It highly disintegrates organized matter, reducing it to ashes and smoke. It is irreversible. You cannot make the ashes return to their original shape and color. Thirdly, fire has no intentionality. The combustion process is random and has no definite purpose. Whatever is touched, if the material is flammable, will be consumed. Fourthly, fire is self-generated: fire causes heat, and heat, in turn, causes fire.'

Matos (2015: 188–191) provides an account of how Amazonians use fire:

'F.A., 41, says that fire is used to clear fields. Otherwise, people can't work among the branches. The fire burns away everything that's dry on the ground, and the plants grow beautifully. This happens all year round. People

plow, clear, burn, and plant. It's the people's custom. We don't know of any other way of doing swidden cultivation without using fire; it comes from the ancients. Fire is better; it cleans everything' (Matos 2015: 188, translated by G.M.).

'Mr. R., 59, says that the swidden was burned so much that it was reduced to bare soil' (Matos 2015: 190, translated by G.M.).

'Mr. H., 38, says that setting fire to the felled vegetation is a better cleaning technique. It's to make it possible to walk on it, to work on it. Mr. R., 77, comments that fire is used to renew the land. In the opinion of Mr. N., 25, we burn the dry grass so that new growth can sprout. It looks beautiful. Fire makes a fresh field along the edge' (Matos 2015: 191, translated by G.M.).

The use of fire is an inheritance of the ecological regime – a socio-cultural practice in the Amazon – accepted without moral questioning. Destructive, it is effective both in dominating nature and in economic terms. This socially incorporated knowledge – the *habitus* (Elias 1994c) – has now given rise to an environmental problem. It burns both the desirable and the undesirable, annihilating coleopterans, arthropods, arachnids, amphibians, rodents, mollusks, marsupials, and annelids, which cannot escape the flames. There are farmers with 10 animals and others with 100, but all aim to grow their herds and need to clear land to expand pasture. From small to large, it is the sum of the ranchers that makes the difference, and it is necessary to investigate the hidden edge effects that may be occurring. The activity entails deforestation and the use of fire, both potential vectors of environmental degradation (Lapola et al. 2023) in floodplains and *terra firme*.

The Logging Problem and the Expansion of Carbon Trading as a Possible Solution

Logging is done selectively to meet the needs of building houses, corrals, fences, and canoes, among other uses. However, as figurations expand their

networks of interdependence – when residents with their open valences connect to networks of large external buyers – the removal of wood grows in scale and becomes illegal, sustained by silence: fear, ties of friendship and cronyism, with no one punished but with clear consequences for the ecosystem.

Trees are sold while still standing. Roads are opened to fell and haul the timber in logs or pieces. Sold in cubic meters, the wood is transported when the river's waters are high, favoring navigation and the transport of large loads. In the words of a resident of Community *Nossa Senhora de Fátima Lago do Massauari* from *Boa Vista do Ramos*:

'The ipê fetched a very good price for them. It reached R\$10,000 per cubic meter; then it dropped to R\$6,000 and reached R\$4,000. Here for us, they give the price on the tree. Now there aren't any more. They've taken all the trees they had' (13/11/24, emphasis G.M.).

The economic return primarily benefits the external buyer, who does not replant the species taken from the forest, cares nothing for the future of the Amazon's climate, for the ecological imbalance, or for the well-being of the region's inhabitants. The experience from the empirical field shows that the sale of standing trees reflects the devaluation of the forest, and cattle ranching arises from a unilateral economic conception. Institutions of international climate governance, such as the Conference of the Parties (COPs) of the UNFCCC, the Kyoto Protocol (1997), and the Paris Agreement entail advanced regulations on climate change, global warming, greenhouse gases, and adding value to the standing forest for carbon sequestration. However, their protective measures do not extend to those who live in and from the forest, but benefits large landowners and the front men who surround them.

The *Kyoto Protocol* approved the use of the *Clean Development Mechanism* (CDM), accompanied by emissions trading. Thus, in the context of the climate crisis, carbon credits have been consolidated as a means to certify and reduce the emission of greenhouse gases (GHG), including CO₂. Following

and *adapting* the rules and criteria established in the aforementioned agreements, carbon credits could be extended to community residents throughout the Amazon hinterland. They could participate as individuals in the voluntary carbon market, acting as potential agents of reforestation, maintaining the standing forest (REDD+), avoiding uncontrolled fire and forest degradation. They could also be included in action plans under the *Nationally Determined Contributions* (NDCs) and, in the context of the Paris Agreement, be recognised as parties. In this way, carbon credits generated in these communities could be traded.

With the aim of challenging entrenched conceptions embedded in Amazonian social relations regarding the (de)valuation of the forest, I would like to illustrate these reflections by the example of a model calculation: Rural management software is able to value of carbon credits per hectare. A steer raised in an extensive system takes about two and a half to three years to reach slaughter weight, averaging between 200 and 250 kg. In June 2025, the price per kilogram of live cattle in the municipalities where the empirical fieldwork was conducted was around R\$ 17.00 (seventeen Reais or the equivalent to three dollars). For the purposes of this example, a small farmer has a herd of 20 animals and sells four. Two steers weighed 200 kg, and the others 250 kg. The sale of the steers, after three years of care, earned R\$ 15,300 (fifteen thousand three hundred reais or two thousand nine hundred and thirteen dollars). For each ox, at least one hectare of pastureland is required. Each hectare produces around seven carbon credits per year. At an average market price of R\$ 400.00 (four hundred reais or seventy-six dollars) per credit, each hectare would yield R\$ 2,800 (two thousand eight hundred reais or five hundred and thirty-four dollars) per year. Four hectares of rainforest, over three years, would yield R\$ 33,600.

However, according to André Arruda, an expert in land-use planning and carbon markets I interviewed, the 80% of the Legal Reserve mandated by the Forest Code 'is not sequestration per se, but rather non-emission through avoided deforestation and the permanence of stocks in the forest, and could

fall under the REDD+ modality.’ Carbon trading from avoided deforestation, in addition to determining the CO₂ stocks, requires identifying the baseline deforestation rate. In the case of planned deforestation (APD), both the size of the area and the licensing period are known. In unplanned (unregulated) deforestation, it is difficult to determine when and how much of the area will be cleared without legal permits. For this reason, it is influenced by location and surrounding pressures and is more likely to occur in areas close to agrarian conflicts and economic expansion fronts. In this modality, a baseline is established through modeling of future deforestation, provided by the organisation VERRA using risk maps. The initial cost of this service is USD 10,000 per request, plus USD 0.25 per hectare. Therefore, for small producers in the Amazon, carbon trading is not yet viable when undertaken individually. However, it could be feasible in a collective arrangement, and for the project to be viable, around 300 to 500 hectares of avoided deforestation per year would be needed.

Thus, carbon credits – which could exceed revenues from the sale of timber or livestock – are currently restricted to large landowners, who have already degraded the land, caused edge effects and fragmentation (Rodrigues/Nascimento 2006) and benefited from the returns. An extension of carbon trade has got the potential to shield communities from deforestation, selective logging, uncontrolled fire, and land sales. This would signal towards the valorisation of the standing forest through the application of a just transition policy, ensuring that Amazonian residents are not harmed, including in their traditional use of land for domestic use and cassava cultivation. From an economic, technical, and scientific standpoint, this approach enables Amazonian residents to weaken the power of complex figurations that plunder the forest and its inhabitants.

Sowers of Ethno-Knowledge and the Creation of Experimental Fields

Following the figurational approach, field data can have socio-ecological meaning without statistical sig-

nificance. Such initiatives shed light on the future of the hinterland, with ecological importance for both humans and non-humans. Therefore, spontaneous actions and experimental interventions by residents outside protected areas should be encouraged. In a cattle grazing area, farmer Mr. H., 57, from *Nossa Senhora de Fátima* from Massauari lake from Boa Vista do Ramos municipality, points out native trees – *ipê amarelo* and *castanheiras* – scattered across the pasture, challenging the notion that pasture must be free of other flora species. In the community of *Santa Maria do Acre* from Boa Vista do Ramos municipality, Mr. J.R., 54, planted *itaubeira* and *piquiazheiro*, and preserves other species to acclimatise and provide shade around his home. Mr. J.R. also cultivates the *piriquiteira do igapó* and *tucuribá*, whose fruits feed a variety of fish. These species are also used to acclimatise and provide shade around his home. Mr. B., 65, from community of the *Nossa Senhora de Nazaré*, from *Araçatuba* river from *Lago do Limão Grande* in *Maués Municipality*, shows us the native species cultivated: *pajurá*, *bacaba*, *tucumã*, *sorvinha da capoeira*, *piquiá*, *andiroba* and *castanheira*, other fruit species, form what Matos (2015) called an agroforestry site. Mr. R., 75, a resident of the *Ipixuna do Massauari* community Boa Vista do Ramos Municipality, has *tucumã*, *castanheira da Amazônia*, *pau-rosa*, *uxi liso*, *jatobá* in his agroforestry yard; Mr. C., aged 60, owns a smallholding on a feeder road off the BR-174 highway, where species such as the *bacaba* palm, Brazil nut tree, wild cucumber, rubber tree, and *andiroba* are found.

Talking, living, and doing without concrete action will not change the course of the social process. To this end, experimental areas can be created in the communities, both on *terra firme* and in floodplains, to establish in-situ germplasm and seed banks. These will serve as examples for new generations, applying the knowledge of previous ones. A team composed of reforestation technicians, teachers, and community members – represented by an experienced forest expert, a seed specialist – could identify species, collect and select seeds, sow them, produce seedlings, and plant native species. In this sequence of stages, eth-

no-knowledge from the ecological regime, accumulated over a lifetime and learned in contact with grandparents, parents, relatives, and other community members, will be passed on to younger generations. The transmission of knowledge through intergenerational symbols (Elias 1994a) is essential, as new generations move away from their roots in pursuit of further education and social mobility (Matos 2015), often with the prospect of leaving the countryside for municipal centers or the state capital. As generations distance themselves from their roots, ethno-knowledge declines. Weakened know-how dulls the sense of belonging and undermines the value of the forest, the land, and the environment. Thus, the weakening of the family figuration and our identity as a community strengthens the figuration of large-scale land and forest acquisition by external agents.

In the context of nature's timescale, the process is long-term, extending beyond the action of a single generation. Species such as *castanheira*, *piquiazinho*, *uxizeiro*, *itaubeira*, and *jatobazeiro*, among others, take at least twelve to fifteen years to reach maturity. This brings us to the second level of the civilising process (Elias 1994, Goudsblom 1995), in which one generation must pass on the norms and environmental conduct needed to the next generation, until the experimental plot matures into a forest. In this way, the control over nature – as part of the triad of controls (Elias 1980) – aims to restore the ecosystem rather than degrading it.

The experimental field can be supported by government agencies and Nongovernmental Organisations (NGOs). Communities could also be given right to claim resources under the guidelines of the international climate governance such as the *Kyoto Protocol*, the *Green Climate Fund*, and other UNFCCC institutions. In order to receive the benefits of carbon credits, they must, of course, comply with certain requirements, such as maintaining permanent nurseries of native seedlings for planting in primary forest and *capoeira* (secondary forest). This applies to communities engaged in logging activities, sustained by a hidden network of consumers, where planting native species is mandatory, and develop projects for

the reuse of discarded timber.

7. Final Considerations

The article argued that – in line with the warnings of international climate governance institutions – global warming poses a threat to human societies, yet to a greater magnitude for non-human species, as their DNA will not be capable of rapid changes to face the climate crisis. In this regard, the concepts of social process, figuration, and personal pronouns as figurational models help us understand, regardless of the geographical space in which social actors are located, the contributions they can make to intensify or mitigate the global climate crisis, which, *par excellence*, is a complex figuration.

Research shows that the Amazon rainforest plays an important role in balancing the global ecosystem. However, complex figurations linked to commodities have advanced, leading to deforestation, fragmentation, the use of uncontrolled fire, and selective logging, and environmental degradation. Supported by the triad of adaptation, ecological regime knowledge, and public policies, the empirical field reveals that human expansion in the Amazon is ongoing.

Field evidence shows that the Amazon forest, outside protected areas, is weakened by entrenched conceptions and a lack of understanding of its role in the ecological balance. It also reveals limited awareness of the importance of forests in capturing carbon dioxide and other greenhouse gases. Yet the carbon credit trade has proven to be an ally of large landowners. In rural areas, it is necessary to value spontaneous actions and ethno-knowledge; to create experimental fields in *terra firme* and floodplain communities to form germplasm and seed banks; to shield communities from figurations that compromise the ecosystem's balance, adopting the motto '*natural defenders – empower, do not deforest or degrade*'; and to value both primary and secondary forests. Small farmers and other people living in and from the forest should be enabled to benefit from carbon credit trade in order to improve the lives of Amazonians and enhance the environment for non-humans. The guiding principle

can be summed up by the phrase: *just as non-humans stand to humans, humans stand to non-humans*.

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