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CHALLENGES AND
SOLUTIONS FOR A
SUSTAINABLE FUTURE

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Challenges and solutions
for a sustainable future

TABLE OF CONTENTS

5	Presentation	Luiz Deoclecio Massaro Galina
7	Why are protected areas important? What are their challenges?	Sueli Angelo Furlan
19	What if we started reforesting? Rescuing life in harmony with nature as a way of relearning how to live an abundant life	Vanessa Hasson de Oliveira
35	Sustainability as culture: respect for the diversity of ways of living in balance with nature and the plurality of life forms	Virginia Chiaravalloti
52	The legacy of Brazilian agrobiodiversity and the food of the future	Gabriela Narezi
63	Payment for environmental services (pes): characteristics, experiences and perspectives in the climate emergency scenario	Natália Jodas
83	Circular economy in Brazilian value chains: progress and challenges	Ana Moraes Coelho, Beatriz Morganti Brandão, Carolina Ximenes de Macedo, Maíra Bombachini Silva, Maria Cecília Alvarenga Carvalho
97	Beginning, middle and beginning: tourism for communities and the environment	Andrea Rabinovici, Zysman Neiman
109	Sustainability from the perspective of the Sateré People	Clarinda Maria Ramos
117	Amazon region and Blackness: notes to understand Black invisibility	Davi Pereira Junior
140	Telling stories to children and teenagers: “Reconstruct(be)ing” from Frans Krajcberg’s life story	Uillian Trindade Oliveira
151	Interview with Paulo Artaxo	Fábio Zuker

LIVING THE FUTURE, REFORMULATING THE PRESENT

Every season projects its futures. Some announce themselves as a promise of continuity, others as a warning. In the contemporary context, we live a time that requires of us the reinvention of the ways of inhabiting the planet and relating to all forms of life. The ongoing social, climatic and technological transformations challenge our structures of thought and forms of collective organization, revealing that the models that brought humanity here may not take us forward. Faced with crises that are not only environmental, but also political, ethical and imaginative, it is urgent to put questions and practices as regards what we mean by development, well-being and progress.

Within this horizon, this edition of *Journal of the Research and Training Center* proposes reflections on the challenges and solutions for a future that fosters life. In this sense, the field of sustainability, when emptied of its complexity and critical dimension, risks becoming a protocol concept, adapted to the imperatives of a development that has historically produced exclusion, inequalities and environmental devastation. Therefore, by proposing a reflection on the challenges and solutions for a sustainable future, we seek to reposition this notion in its ethical, political and cultural density.

The Research and Training Center of Sesc São Paulo, as a place for articulation of knowledge, proposes, in this publication, a broad and committed listening: here we find diverse perspectives – coming from sciences, arts, community practices, ancestral knowledge, among others – that call us to imagine new life arrangements, irrigated by regenerative bonds and by more fair relationships between beings, territories and temporalities.

To this end, it is essential to recognize the harmful effects of a model of society that was built at the expense of expropriation of land, erasure of cultures and exploitation of bodies. Even today, environmental degradation continues to be intertwined with the idea that planet serves us with inexhaustible resources. In this scenario, against the tide, contributions of indigenous peoples, quilombolas and traditional communities emerge, whose cosmologies point to ways of life centered on reciprocity, interdependence and care.

In this sense, Sesc mobilizes its values in this field and this year is related to the 30th United Nations Climate Change Conference - COP30, proposing reflections on social and environmental challenges. Therefore, the institution is interested in expanding this field of debate, bringing together analyses, poetics and experiences that help us formulate strategies for possible and desirable tomorrows with criticality and sensitivity. A future that is not limited to survival, but bets on dignity, diversity and power of common life.

Luiz Deoclecio Massaro Galina
Director of Sesc São Paulo

WHY ARE PROTECTED AREAS IMPORTANT? WHAT ARE THEIR CHALLENGES?

Sueli Angelo Furlan¹

ABSTRACT

The article discusses the importance of Protected Areas (PAs) and the challenges they face in the context of climate change, highlighting the evolution of the conservation model in Brazil, from strict preservation to the recognition of the knowledge of traditional peoples and communities. PAs are strategic for conserving socio-biodiversity and promoting low-impact activities such as ecotourism and resource management, as well as providing essential ecosystem services free of charge. The article contrasts the 'Park' model, often marked by territorial conflicts, with the 'new paradigm of collaborative conservation,' which is more inclusive and community-based. Although regulations provide for social participation through management councils, limitations regarding representativeness and power-sharing persist. The consolidation of social participation requires continuous negotiation and learning, reflected in regulations and best practices. The article concludes that effective conservation depends on paradigm shifts and investments in collaborative governance to ensure conservation with socio-environmental justice.

Keywords: Protected areas; collaborative conservation; climate change; collaborative governance

The accelerated exploitation of natural resources has profoundly affected world ecosystems. Unsustainable production practices, whether in rural or urban settings, have contributed to biodiversity decline (Santos, 2021). According to the report by the Intergovernmental Political Scientific Platform on Biodiversity and Ecosystem Services (IPBES, 2019), out of a total of eight million known animal and plant species on Earth, approximately **one million are at risk of extinction** —many of which may become extinct within decades. 'Scientists also call our attention that such losses will affect the production of our food, the quality of the air we breathe, and the water we drink' (WWF, 2019). Among the primary degradation factors are deforestation, wildfires, the transformation of natural habitats into monocultures (such as soy, grains, sugarcane, and livestock grazing areas), alongside industrial and urban sprawl (Mittermeier *et al.*, 2005, p. 601; Demartelaere, *et al.*, 2022; Damasceno *et al.*, 2022; Belanha, 2023).

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The article discusses the importance of Protected Areas (PAs) and the challenges they face in the context of climate change, highlighting the evolution of the conservation model in Brazil, from strict preservation to the recognition of the knowledge of traditional peoples and communities.

PAs constitute fundamental state strategies for nature conservation. Nevertheless, such protected zones frequently exist within spaces contested by competing economic and political agendas. The establishment of PAs imposes land-use restrictions and, by removing these territories from productive use and market circulation, may generate conflicts with local populations. Many PAs exist as isolated fragments within degraded landscapes, disconnected from sustainable and inclusive production practices.

Brazil has one of the largest biodiversities on Earth, with biomes such as the Amazon Forest, the Cerrado, the Atlantic Forest, the Pantanal, and the Pampas. In this context, PAs play a strategic role in biodiversity conservation by providing critical habitat for threatened flora and fauna species. These protected areas also contribute to ecosystem maintenance by safeguarding fundamental ecological processes, including hydrological cycles, climate regulation, and soil fertility. Moreover, they safeguard critical water sources for human consumption and economic activities while enhancing ecological connectivity by facilitating gene flow among species populations through biological corridors.

PAs are core allies in fighting climate changes. The forests and soils protected within these areas sequester substantial quantities of atmospheric CO², thereby contributing to mitigate greenhouse gas emissions. Furthermore, conserved areas demonstrate greater resilience to extreme weather events, including droughts and floods, thereby enhancing local communities' adaptive capacity to climate change impacts (Melo *et al.*; Stoll *et al.*; Pellegrini *et al.*, 2005).

In Brazil, specific legislation across federal, state, and municipal governance levels provide for the establishment of protected areas. Their designation incorporates scientific research, civil society initiatives, and private sector engagement, encompassing both public and private lands. Their management plans detail use and restriction based on a control and planning logic (Little, 1992, p. 16). However, given the state's representation of particular interests – including those of production sectors and dominant classes - a critical examination of each PA becomes imperative. By legitimizing state control through scientific expertise and discourses of the common good, territories of traditional people and communities, have been systematically disregarded and devalued ultimately undermining the protection of Brazil's socio-biodiversity.

As mentioned above, Protected Areas (PAs) are legally established areas demarcated by public authorities with the primary objectives of biodiversity preservation and ecosystem service maintenance. These protected areas operate under Federal Law No. 9.985 (2000), which established the Brazilian System of Nature Conservation Units (SNUC). Under this legislation, PAs fall into two broad groups: (1) Strict-Protection Units (e.g., national parks, biological reserves, and ecological stations), focused on nature preservation and permitting only indirect resource use, and (2) Sustainable-Use Units (e.g., extractive reserves, sustainable development reserves, private natural heritage reserves, national forests, and environmental protection areas), which allow direct resource exploitation following sustainability criteria.

Despite their ecological function, PAs also hold significant economic importance. They foster sustainable economic activities that generate employment and income, including ecotourism, organic production, and sustainable management of natural resources. Products from these areas are also part of this economic potential. Simultaneously, PAs provide unpriced ecosystem services – including pollination, climate regulation, and water purification – whose technological substitution would require substantial investments. These areas also attract financial resources through payments for environmental services and international climate funds.

The valuation of nature throughout history reflects evolving societal perspectives, ranging from enchantment to commercialization. There is an evident conflict between the public space planned by the State and the space occupied by traditional communities. Local communities have been marginalized under the government's justification of protecting biodiversity or providing the urban population with recreational areas (Diegues, 2001, p. 66; *Id.*, 2008; Marinho; Furlan, 2024). Despite the recategorization of some strict-protection PAs, conflicts between dominant scientific paradigms and traditional knowledge persist. The imposition of state-centralized management models disregarded the historical role of these populations in habitat conservation, resulting in the erosion of ancestral knowledge and contributing to cultural genocide (Little, 2002).

These tensions have given rise to two divergent pathways – confrontation versus alliances. While some regions have seen conflicts result in increased territorial autonomy for local peoples, Brazil demonstrates only modest progress in collaborative conservation models (Maretti *et al.* 2023) and participatory governance systems characterized by resistance, resilience, and partnerships between communities and regulatory authorities. This contradiction demands critical acknowledgment. While the establishment of PAs has constrained traditional livelihoods and triggered

displacements, it has simultaneously curtailed real estate speculation and the expansion of predatory land uses — which typically displace communities with greater violence and precariousness (Yamane, 2019).

The path towards inclusive, equitable, and fair conservation demands the simultaneous recognition of both human rights and the rights of nature (Ferdinand, 2022). Brazil currently experiences a transitional phase whereby PAs remain indispensable, in spite of the degradation primarily driven by market-oriented activities operating under outdated preservation paradigms still prevalent across societal sectors. PAs are key instruments to safeguard both nature and culture. In a continental-scale nation of exceptional diversity, PAs are strategic for safeguarding both natural and cultural heritage, constituting fundamental pillars of environmental frameworks. Significant progress remains necessary to achieve a more comprehensive, equitable, ethical conservation fully incorporates the knowledge and practices of indigenous peoples and traditional communities.

From a sociocultural perspective, PAs play a significant role in enhancing cultural values and human well-being while bridging scientific and ethnoscientific knowledge. Indigenous territories, extractive reserves, and sustainable development reserves legally safeguard the lifeways of indigenous peoples, quilombola communities, riverside dwellers populations, and artisan fishers, ensuring their continued occupation of traditional lands². PAs also serve as critical spaces for environmental education, enabling awareness-raising activities and training programs on socioecological topics. Furthermore, they provide spaces for leisure, recreation, and contact with natural systems, contributing to the population's physical and mental health.

Despite their relevance, Protected Areas face several challenges in Brazil. Many of these areas have limited financial and human resources, compromising their management and supervision. External pressures including illegal deforestation, poaching, mining operations, and land grabbing constitute persistent threats to PAs' integrity. The establishment of these protected areas frequently occurred without meaningful consultation with local communities, generating enduring land tenure conflicts and resistance to conservation. Furthermore, the lack of land tenure regulation in several state-designated units (particularly strict-protection PAs) - where boundaries remain unresolved and properties await expropriation - significantly impedes proper management and effective ecological protection of these territories.

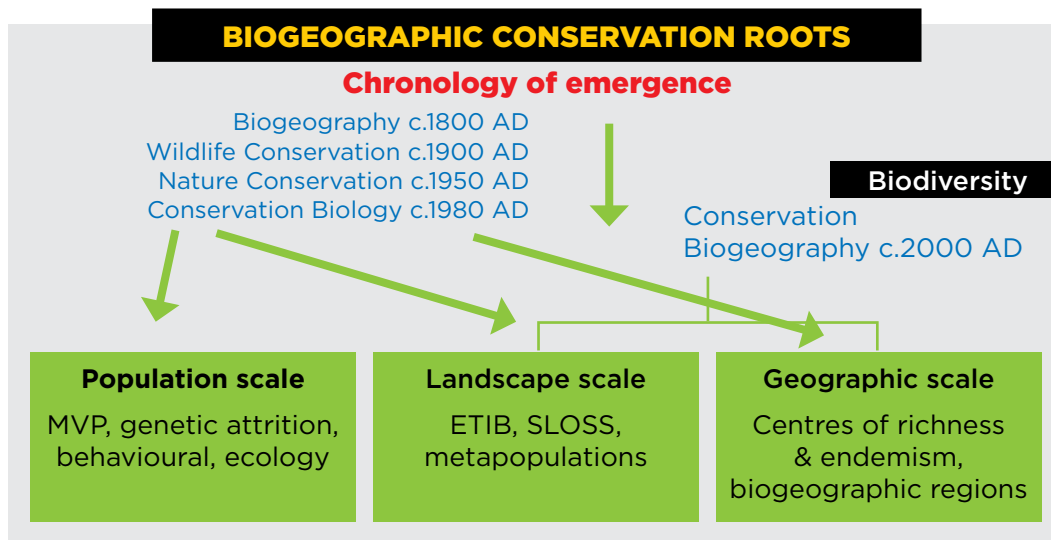
² We suggest referring to the Federal Decree 6040, which enacted the Brazilian Policy on Sustainable Development of Traditional People and Communities in 2007.

DO CONSERVATION IDEAS GUIDE POLICIES FOR PAS?

Modern ideas on nature conservation emerged during the 19th century through a Euro-American dualistic lens that separated nature and culture. This conceptual framework was shaped by Western European and Eastern U.S. elites (Jepson; Whittaker, 2002). Early conservation efforts prioritized wildlife preservation and scenic beauty, driven by both utilitarian and spiritual values (Ladle; Whittaker, 2011) (Figure 1). Within this context, two dominant paradigms emerged in the 20th century – *conservationism*, which advocated the thoughtful use of natural resources; and *preservationism*, which promoted nature's inviolability for spiritual and contemplative purposes (Diegues, 2001). This dichotomy between use and non-use of nature shapes protected area conceptualizations to this day.

In Brazil, the preservationist model consolidated during the 1970s–1980s, establishing under the so-called “Park” model. Despite some progress, this approach has generated conflicts by excluding local populations from protected areas, frequently overlapping with preexisting inhabited territories, thereby reinforcing the nature-culture dichotomy. Social exclusion and systematic disengagement from rural communities became characteristics of this paradigm.

Figure 1 – Foundations of Biogeographic Conservation.



Source: Ladle, Whitaker, 2011.

From the 1980s onward, decentralized socio-environmental approaches emerged, integrating conservation with community participation, as exemplified by the Brazilian rubber tappers council in establishing Extractive Reserves. During the subsequent decade, conflicts intensified between proponents of biocentric conservation and advocates of integrated

socio-biocentric models. Transformations in conservation narratives have significantly reshaped public policies, livelihood strategies, and political processes (Hutton; Adams; Murombedzi, 2005).

Conservation became a state-national prerogative, thereby entrenching the dualism between humanity and nature. The creation of National Parks, influenced by a romanticized narrative, reinforced the notion of pristine wilderness as spiritual and psychological refuge for the urban-industrial society (Diegues, 2001). Despite its ecological relevance, this model ignored the populations who historically inhabited these territories.

Over time, the conservation movement has incorporated cultural, spiritual, and social values (Fernandes; Irving, 2017 p. 278). The paradigm that human activity and conservation could coexist gained traction through territorial conflicts and the activism of Indigenous peoples and traditional communities (Doebeli, 2022). These frequently marginalized groups inhabited territories labeled as 'wilderness,' yet which had in fact been carefully managed and occupied across multiple generations. The 'untouched nature' paradigm has challenged by Global South scholars and Indigenous and traditional communities. For them, the so-called 'empty' territories were in fact living spaces imbued with history, culture, and management. In this context, the landscape embodies competing interpretations – an aesthetic object for urban elites, habitats for scientists, and a living space for local communities. (Diegues, 2008).

Diegues (2008 p. 54) describes the 'bioanthropomorphic myths' developed by traditional people, connecting nature, culture, and the supernatural. Godelier (1984) states that forests constitute either home or obstacle according to the observer's economic rationality. Thus, conservation imposed a unique, Western perspective, causing conflicts and erasing diverse lifeways.

The global expansion of the 'Park' model has caused territorial and cultural conflicts, disregarding conservationist practices of Indigenous and traditional communities. On the other hand, conservation consolidated major advancements in protecting biodiversity. Since 2003, a 'new paradigm of collaborative conservation' has grown (Borrini-Feyerabend, 2013; Maretti, 2022). In 2017, ICMBio proposed a collaborative approach, with the participation of communities. The embrace of an inclusive paradigm between government and society has become a core objective, particularly in facing climate change. The collaborative conservation paradigm poses challenges, as it requires the recognition of rights and the democratic dialog with territories.

However, collaborative conservation approaches fundamentally seek to accept, promote, and mobilize diverse formal and informal partnerships to achieve these objectives — a societal imperative that, as established in Brazilian Constitution of 1988, represents both collective interest and shared responsibility. This approach significantly concerns the conservation of nature. For example, the engagement of key societal stakeholders proves essential to mobilize socioeconomic and political support for ensuring effective management across all protected areas. This approach should also consider the improvement it potentially brings to enhance management and provide society with the best services (Maretti, 2021, p. 7).

There are critics to community engagement models and skepticism regarding the efficacy of isolated protected areas – Hutton, Adams, and Murombedzi (2005) demonstrate that approximately 40% studied parks located in tropical areas show no superior ecological conditions compared to unprotected areas (Bruner *et al.*, 2001). There is growing consensus that community engagement models require refinement and that conservation should properly account for territorial historicity and cultural diversity.

Nature conservation should constitute a social movement that seeks to redefine values governing human-nature relationships (Jepson; Whittaker, 2002; Teixeira, 2022). Collaborative conservation and sociodiversity valuation are transformative pathways for renewing conservation epistemologies, overcoming colonial paradigms that erased Indigenous cultures. However, like every ongoing paradigm shift, conservation, either with or without human presence, is a persistent dilemma. Scientific evidence reflects perspectives that either segregate or integrate nature and culture. A significant advancement lies in the growing recognition of social and historical ecology (Teixeira, 2020; Maretti, *et al.*, 2023).

GOVERNANCE, ENGAGEMENT OF PROTECTED AREAS

Since 1996, globalization has reshaped approaches to addressing common problems on a global scale. The Commission on Global Governance redefined governance as the set of formal and informal mechanisms through which individuals and institutions – both public and private – handle these challenges (CGG, 1996). This framework expands governmental action by incorporating players such as NGOs, social movements, corporations, and global markets.

In environmental and natural resource management, civil society participation has become indispensable, though its institutionalization remains an incremental process. Milot (2009) highlights the State's evolution from a centralized authority to an enabler of engagements through collaborative models. This transformation materializes into resolution spaces that institutionalize the collective management of common assets.

While governance theories lack a consolidated typology, they demonstrate significant capacity to mobilize stakeholders, generate actions, and incorporate diverse values and individual positions – factors that amplify their complexity, particularly in the environmental framework. Casteigts (2009) proposes that territorial governance should function to align scales, decision-making processes, and cognitive dimensions, conferring coherent and stable collective actions.

An advancement was the creation of Protected Areas (PAs) advisory and managerial councils, provided for by Law No. 9.985/2000 (SNUC). These councils, consisting of representatives from public authorities, civil society, and local communities, are essential for collaborative conservation.

Research points out PAs managerial councils are innovative management instruments, and are relevant to strengthening the socioenvironmental democracy. The governance of PAs encompasses decision-making processes and mechanisms regulating biodiversity protection and sustainable use, requiring active council participation to ensure standing and efficacy. Cozzolino and Irving (2006) propose five principles to evaluate governance – standing and voice, direction, performance, accountability, and equity.

Effective state-society collaboration enhances management outcomes but necessitates active and skilled participation across social sectors. This demands social learning – the capability of participating effectively. The diversity of knowledge, interests, and experiences within councils fosters more democratic and transparent decision-making that better reflects local realities, while cultivating the sense of belonging and shared responsibility – critical factors in conflict prevention and resolution.

Nevertheless, challenges persist. Barriers such as limited access to information, power inequality, and the lack of effective communication channels compromise participation. Facing such setbacks requires institutional strengthening, continuous training, and commitment to inclusive practices.

While legal frameworks ensure social participation, contradictions and limitations remain regarding representativeness, autonomy, influence, and equitable power sharing. Consolidated participation requires sustained negotiation and learning cycles that reciprocally shape legal frameworks, the decisions of stakeholders, and the period between decision and implementation.

Salles (2009) emphasizes that despite international organizations encouragement for participatory governance, cultural particularities mediate its implementation. Therefore, he proposes shared responsibility as

a foundation of social transformation. Frechette (2009), in turn, underscores that transitioning governance requires more than legal mechanisms – it demands fundamental cognitive and practical shifts, a finding particularly relevant for PAs councils.

Van Tilbeurgh and Le Dû-Blayo identify public debate as a starting point for collective construction and an area for conflicts between representative and participatory democratic systems. Recognizing the conflicts between local and central power, and between civil society and State, is essential. In this context, lawfulness and legitimacy are pillars for a joint effort between State and society (Bobbio, 2009).

Thus, investing in collaborative governance systems is paramount to ensure the effectiveness of PAs as instruments of socioenvironmental conservation and justice. The Brazilian experience demonstrates the feasibility of advancing participatory democracy, challenging deterministic claims about Latin American institutional path dependencies precluding inclusive governance arenas. We have a living, promising process sustained by a new paradigm of collaborative conservation – with or without the direct presence of the State.

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WHAT IF WE STARTED REFORESTING? RESCUING LIFE IN HARMONY WITH NATURE AS A WAY OF RELEARNING HOW TO LIVE AN ABUNDANT LIFE

Vanessa Hasson de Oliveira¹

ABSTRACT

With an apocalyptic scenario in place, after more than 50 years of global environmental policies, management tools aimed at promoting sustainability continue to be created based on the idea of unlimited economic development, with the use of limited natural resources. At the same time, Latin America, with emphasis on Ecuador, Bolivia, Colombia and Brazil, based on the leading role of indigenous peoples, began a movement in 2008 centered on the locality and recognized by the UN, through which it is demonstrated the fact that we are Nature together with the other beings that inhabit the Earth, our Common Home, in the words of Pope Francis,² or else, we will be mere human resources on the verge of extinction. Rescuing the principles of the abundant life system that constitutes the Earth and applying them to all social systems created from an impoverished anthropocentric perspective may be the way forward to achieving true sustainability.

Keywords: Environmental collapse. Interdependence. Rights of Nature. Governance. ESG.

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 - 2 At the time of writing, Pope Francis (Francisco, in Portuguese) passed away on 21 April 2025. One day after his death, International Mother Earth Day was celebrated, and this author travelled to the hinterland of Pernambuco for another mission for the Rights of Nature. This time, in recognition of another Francisco, the São Francisco River — Opará in the native language — in conjunction with the indigenous community of the Pankararu people. The paths that lead us to the recognition of more than human rights pass through a transcendental vision that is capable of reacquiring the original knowledge that enabled us to be one with all life, to be one with Nature. In this sense, the mission during which this text is being written and the writing itself remain as my humble tribute to this great human spirit, who was in turn inspired by the greatest ecologist the Earth has ever known, the saint of Assisi, Francis. In the book *Direitos da Natureza* [Rights of Nature] (Oliveira, 2021), this author dedicates a chapter to describing Pope Francis' leadership in the global movement for the recognition of the rights of Mother Earth, from the adoption of the name of Saint Francis, the world's first ecologist, culminating with the publication of the Papal Letter - Encyclical Laudato Si (Pope Francis, 2015).

Presence, innovation, and translation: I think that sums up the relationship between plants and photosynthesis. I insist on what Primo Levi said: I hope that one day we will have the wisdom to perform photosynthesis. Let's see if we can get there (Scarano, 2024).

HALF A CENTURY OF HISTORY

In 1962, a major book was published by a woman, Rachel Carson, a marine biologist who turned her attention to land cultivation and agriculture, which at that time was indiscriminately and extensively treated with pesticides, the effects of which were still poorly understood.

This book was given the evocative title *Silent Spring* (Carson, 2010), seemingly referring to the difficulty we have in listening to Nature, in perceiving the systemic transformations in Nature that are reflected in our lives.

This difficulty in perception is what has led us to the state of ecological crisis that is now collapsing.

Shortly after this publication, a small group of leaders from science, economics and the manufacturing industry created the Club of Rome, which took Carson's publication as one of its foundations to promote the beginning of the debate that would be consolidated on scientific grounds in 1972 with the publication of a study produced at MIT – Massachusetts Institute of Technology, coordinated by the environmental scientist Donella Meadows, which was titled *The Limits to Growth* (Meadows et al., 1973).

In 1987, another woman took the lead in the global debates on the environment. The then Prime Minister of Norway, Gro Harlem Brundtland, took charge of coordinating the research work, whose final report was published under another suggestive title, *Our Common Future*, and which ultimately conceived the concept of Sustainable Development (Brundtland, 1991).

The creation of the concept of sustainable development was very interesting at that time and for what interested the social stratum represented by the Club of Rome: how to continue on the path to development in view of the scarcity of natural resources, the raw material of the manufacturing industry.

The solution presented, continuing along the same path of exploitation towards the accumulation and concentration of capital, but taking care to conserve resources to the extent possible for their renewal so that the source would not be exhausted, ended up reinforcing a reductionist way of thinking and a vision that everything that was alive had economic value,

a way of thinking that is completely divorced from the fact that life, and above all abundant life, does not include the economic value of things.

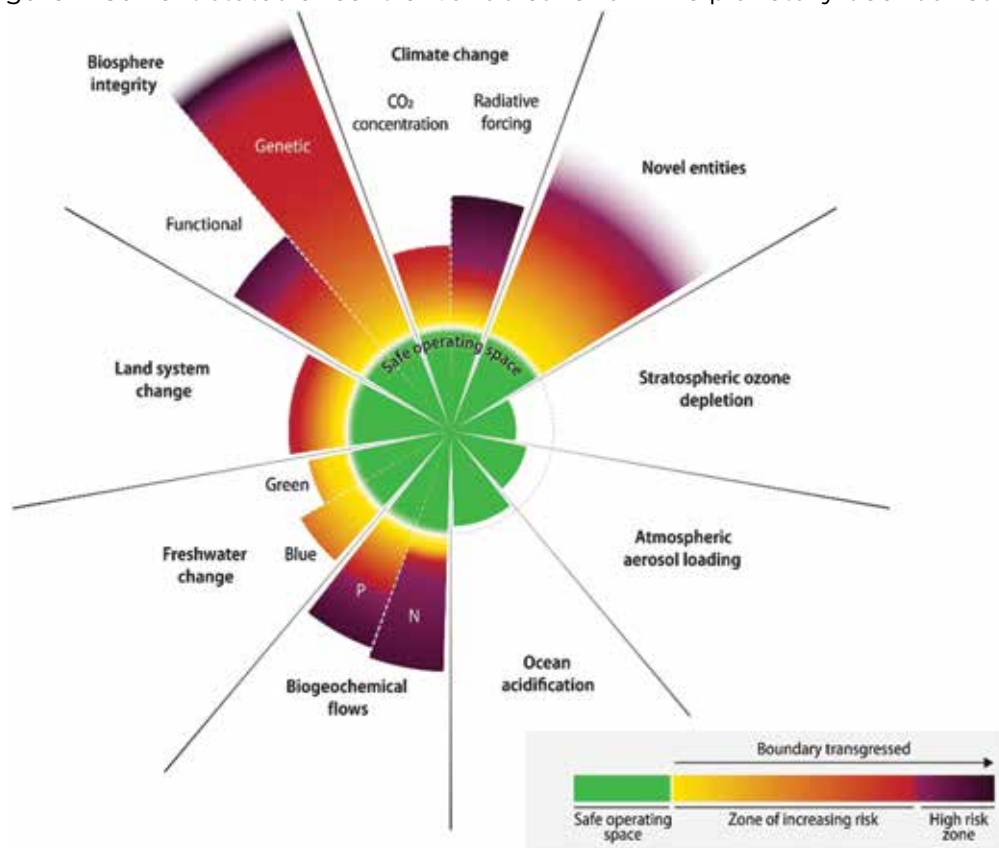
More than sixty years after the publication of Carson's exposé book, *Silent Spring*, and even after the creation and development of the complex legal system that introduced an intricate set of governance and environmental protection standards, our common future since the publication of the Brundtland Report in 1987, which is now the present, shows that initiatives have not been sufficient to halt the destruction of Nature. This has been repeatedly confirmed by science.

Scientific studies have found, as can be seen in a recent publication in the renowned *Science Advances* (Richardson et al. 2023), that we have probably already passed the point of no return. This verification is carried out by measuring the biophysical and biochemical processes that regulate the state of the planet. These processes are what give the Earth system its stability, such as the emergence of new beings and the concentration of CO₂, among others. They are systems that support life itself, represented by the integrity and interrelationship of life and well-being of human and non-human beings.

The study states that: *"There is accumulating evidence that the current level of boundary transgression has already taken Earth system beyond a 'safe' zone"* (Richardson et al. 2023).

As the time and space scale is very large, and because it is not yet possible to determine exactly when the point of no return will be reached, the IPCC – Intergovernmental Panel on Climate Change has provided this diagram so that even lay people can interpret the gradual transition from yellow to red (high risk) and purple (very high risk).

Figure 1. Current status of control variables for all nine planetary boundaries.



Source: <https://www.science.org/doi/10.1126/sciadv.adh2458>. Accessed on 19 April 2025.

The fact is that we have crossed six of the nine frontiers identified by science. The constant threat of an ecological crisis no longer exists. It collapsed along with a system, which is now undergoing a natural process of reconfiguration aimed at maintaining life on Earth.

The question now is: will we be resilient enough to survive this process of reconfiguration? How do we want to participate in this, aiming to fostering the greatest possible diversity and, if possible, the diversity of human life as well?

MY HALF CENTURY OF HISTORY

My experience as a lawyer and researcher goes hand in hand with this history, as I was born a few years after that silenced spring, after the awakening of science and opinion-forming leaders, and it is no coincidence that I have always been passionate about the beings of this Earth and about Earth itself.

Since I was a little girl, I used to climb the tree in my backyard and, surrounded by that welcoming place with its thick, welcoming branches, I absorbed the issues of my everyday little girl's world, listening to what

that leafy canopy and all its residents had to say to me. I grew up with the idea of defending those who are marginalized and of course I ended up becoming a lawyer.

After more than twenty years practicing law, in 2014, my curiosity and love of research, coupled with a deeper immersion in the Pachamama movement that has been present in the world since the enactment of Federal Constitution of Ecuador in 2008, led me to complete a PhD in Rights of Nature, which brought me into contact with various international organizations.

Due to the pioneering nature of the topic in Brazil, I ended up gaining some recognition as the first and most active Brazilian expert in the UN program, created in 2009, on the ecocentric perspective and the proposal for the enactment of a Universal Declaration of the Rights of Mother Earth. In this capacity, I was invited to form a group of Brazilian academicians who, together with me and 120 other researchers and activists, constituted the group of expert members of the Harmony with Nature program.

In the 1990s, while working with entities in the water resource management system, my master's research accompanied my professional work. Even in this research on the complex topic of cross-border river basin management that I have addressed, studying the case of the two largest, the Amazon Basin and the La Plata Basin, living alongside the creatures of the tree canopy and the ants guided me to adopt, to some extent, an ecocentric perspective, using the lens of a holistic view of water as a common, cultural and spiritual good.

It was not my PhD nor my desire to fight for those who are denied a voice that made me realize the key to making a contribution that would help reverse the course of the point of no return that lies just ahead, long before the horizon. It was through my personal experience in the struggle to defend the Rights of Nature that I realized that working like an ant will not stop the destruction, nor will it completely regenerate what has already been destroyed, even if from now on we are finally united in a single new ancestral understanding that we are Nature, because this anthill of human beings is already undergoing an irremediable and profound systemic transformation.

I did not need to consult scientific reports or visit the Amazon when I gave a talk at TEDx Amazon in 2023³, during the worst drought

3 Access the presentation at TEDx Amazon 2023 at: <https://youtu.be/0kw6422L6-o?si=1C6a-5hXCu7DFyM2>. Accessed on 19 April 2025.

ever recorded, accompanied by thick smoke from burning forests, to realize that the dream of a “future we want” is no longer going to happen. In fact, it is already here, and it is very different from what we dreamed of when we sought to establish sustainable development.

I understood that the ecological crisis we were experiencing has collapsed. I needed to participate with my own life in the interrelated lives of other human beings, and more than just human beings, and feel in my own body that a systemic transformation was underway and that only with great resilience will it be possible to participate and coexist.

Every time I observe degraded human relationships, I see how this is interrelated with the degradation of Nature. And this seems very clear to me because I understand that we are Nature, together with nature beyond humanity, as Carson herself said. That is why I adopt two main premises in my consulting work: that harmony must be restored to relationships and that everyone must be included in the process, humans and more than humans alike.

As mentioned above, in 2014 I completed my doctoral research on the Rights of Nature and, based on this, I published a book on the subject, which is now in its second edition (Oliveira, 2021). I began to lead a process of articulation with the help of committed volunteers working in the organization of which I am the founder, MAPAS⁴, promoting advocacy in the legislation of various states and municipalities, which inspired some court decisions and which now add up to more than two dozen cases of recognition of the Rights of Nature, on beings or regions, approved and dozens more in the process of being articulated or approved, such as the emblematic cases of the recognition of the Rights of Nature of an Amazon River, the Komin memem River, and of a wave of the Sea, the Onda da Foz, of the dying Doce River, which are now recognized as right-holders.⁵

It was during this time of research and activism over the last fifteen years, in deep contact with Nature and with indigenous peoples, quilombolas, and other traditional peoples, that I saw that, however inspiring the proposal to recognize the rights of all members of Nature without distinction may be, these initiatives would not be enough to change the state of affairs, or rather, to contribute to a more positive outcome toward the reconfiguration of the system that is already underway.

⁴ Learn more at: www.mapas.org.br.

⁵ The map of Rights of Nature in Brazil can be found on the website of the organization. To learn more, visit: <https://mapas.org.br/advocacy/>. Accessed on: 19-Apr-2025.

Thus, together with MAPAS, we have designed ecological education and technical advisory projects based on the principles and values of the Rights of Nature, so that other worlds, those that still survive from the exploitation of Nature, agonizing alongside it and contributing to a bleak outlook, may enter this first, ancestral world, which organically co-creates with a *sentipensar* (integration between feeling and thinking), a *corazonar* (think with your heart) (Llasag, 2018) that promotes other economies, other bases for education and governance, rescuing ways of life in harmony with the Earth.

SUSTAINABLE DEVELOPMENT - THE HERO WHO BECAME THE VILLAIN

At some point in history, probably during the process of human densification in urban centers that was part of the acculturation process — as a consequence of distancing ourselves from beings that were more than human —, human beings succumbed to their less humanized or less savage side and ended up distancing themselves from another, more human and more natural side, which was commonly exercised in the inevitable and necessary (co)existence with other beings of the same species and other species, and thus allowed their innate orientation towards solidarity to wither away.

What could have been an economy based on solidarity, respecting the biological condition of human beings inclined towards freedom and creativity, ended up conceiving a system that, instead of promoting collective well-being, ends up accentuating inequalities and causing damage to both individuals and the planet.

The system put in place and its planned development were shaped on foundations that favored only a small part of human society, generating a huge negative externality with the establishment of incredible inequality within the global community. Market logic has become a way of life, with significant impacts on sustainability and ethics, revealing the need to re-examine the principles that govern the economy and society.

Amidst the debate on sustainable development sparked by this reality, however, no consideration was given to rethinking the development model itself; the intention was to continue with the premise of economic growth as the idea of development, imagining that it would be possible to “save” these so-called natural resources so that more development could be achieved by continuing to exploit Nature, even human nature.

In other words, the theory formulated in the report that outlined Our Common Future, and before that in the 1972 report, was based on principles that did not include Nature from the perspective of its constitution

as life itself, as life in itself. There was talk of its economic value, talk of consideration for an environment over which human beings exercised dominion, separating consideration for people in this context, as if they were not — as if we were not — interconnected with the other beings that together make up, that we make up, Nature, the environment, the Earth.

Economic value was the basis of policies concerned with the future. It was the predominant factor, together with the instrumentalization and quantification of damage, in this case as a measure of the extent of the use of natural beings, including human beings, who were considered merely as “resources”, water resources, forest resources and even human resources.

One of the results was the promotion of extensive, detailed and complex legislation, with the conviction that it would be sufficient to contain the ecological crisis that had been evident for more than half a century. However, this legislation disregarded the dynamics of life itself and the very life of Nature, ignoring that the path could be leading to the ecological collapse that we are already experiencing.

Then we were stunned by statements from renowned scientists that climate change predictions and perceptible changes were wrong. They were much faster and are already happening. Or we are confronted with studies such as the one cited below, from *Science Advances*, which confirm the perception of many activists and researchers, who are now experiencing a serious existential crisis around the question: why continue fighting if scientific publications lead to the conclusion that there is no time left?

[...] all the biosphere-related planetary boundary processes providing the resilience (capacity to dampen disturbance) of Earth system are at or close to a high-risk level of transgression (Richardson *et al.*, 2023).

With this apocalyptic scenario, what motivation would remain to continue on the path of caring for environmental issues, caring for our organizations, our families, and ourselves?

The answer comes from science itself, if we do not want to rely solely on faith that there is something higher that is pleased with the struggle for life. Nature and Earth consist of a huge tangle of interrelationships, a complex system that undergoes systemic transformations all the time.

Our model results demonstrate that one of the most powerful means that humanity has at its disposal to combat climate change is respecting the land system change boundary. Bringing total global forest cover back to the levels of the late 20th century would provide a substantial cumulative sink for atmospheric CO₂ in 2100 (Richardson *et al.*, 2023).

Participating in the process of reconfiguration of the Earth system by choosing ethical actions that promote truly sustainable life at every step of the way, whether by saving water when showering or planting trees, is a condition not for rebuilding a work of art that is finite in its planning, but as a process of alignment or realignment of each human being, as a participating member of this system, together with other beings that are more than human.

The result, which in fact never ends, at least on the scale of time that we can comprehend, is verified moment by moment and will consist of the sum and mixture of the actions and facts of the very conformation of life, of Nature, produced individually, collectively and globally.

In other words, the maxim that *you are the change you want to see in the world*⁶ still holds true.

The good news is that the tipping point can also be positive, i.e., preserving the resilience of the system under conditions conducive to maintaining biodiversity as we currently know it.

Just as climate scientists point to the limits of the systemic processes that sustain life on Earth, social scientists such as Humberto Maturana and others from systems theory demonstrate that there is another tipping point, the social tipping point, the possibility of a radical paradigm shift based on individual actions and transformations, added to local collective actions that add up to global collective actions, enabling us to negotiate more peaceful and loving ways of life, in which reality is one of abundance.

These positive, ecocentric paradigms, in contrast to the anthropocentric ones that led us to this state of affairs, can promote profound transformations in systems of governance and social and economic engagement, without neglecting the legal system.

BIOMIMICRY AND NATURE-BASED SOLUTIONS

This is the expected result from life itself happening. Life that can be clearly observed in perfection in the dynamics of more-than-human Nature. And if so, what other force more intelligent than this one, which so clearly expresses the perfection of abundant life, could provide clues as to how to contribute to this result?

It is Nature, embodied in the relationships and interrelationships that sustain it, in the production of life and abundant life, that has

⁶ This idea is attributed to the pacifist Mahatma Ghandi.

demonstrated that new configurations are occurring in the system and the ways in which they are occurring. So, the smartest thing to do right now is to look to nature as your teacher and ally.

Biomimicry is one of the foundations we have brought with us since the conclusion of that unprecedented research in Brazil on an ecocentric paradigm, which is actually polycentric, since it is centered on love and systems theory. Biomimicry can be defined as the attempt by humans to recover innate knowledge about the interdependent life of other beings in Nature.

For indigenous peoples, practicing biomimicry consists of practicing their own ways of life, in perfect synchrony with the beings and times of Nature; it consists of maintaining the knowledge of those who came before, for whom there is no separateness but rather unity in diversity, and that life functions according to certain coinciding values that act on everything that resides on Earth.

With the defense of a PhD in diffuse and collective rights, based on these principles, we worked on a proposal for political, legal and educational action that consisted of presenting these biomimetic values and highlighting them with proposals for laws in the three spheres of government, which in turn have served as a basis for case law, including in the highest courts of this country.

In this sense, MAPAS acts as an institutional arm of research and for over a decade has provided technical advice and brought together academic research to promote and support the recognition of the rights of Nature. We assist in the implementation of public policies to establish eco-centric governance in Brazil and around the world.

MAPAS is a pioneer in the global and national movement for the recognition of Nature as a facilitator of networking, adding to its direct involvement in more than twenty cases of recognition of the Rights of Nature in the country. We participated in the consolidation of the Rights of Nature in municipal organic laws, in cities such as Bonito (PE), Florianópolis (SC) and Guajará-Mirim (RO), state constitutions and state environmental policies, as well as in the recognition of the rights of the first river, the first wave of the sea and the first mountain and its mountain range, in Brazil.⁷

⁷ The movement for the Rights of Nature in Brazil has grown enormously since the pioneering work of the MAPAS organization, together with its founder and author of this text, in 2015. Since then, other organizations have joined forces to create a Brazilian Coalition for the Rights of Nature, whose activities can be found on its website: <https://direitosdanatureza.eco.br/>. Accessed on 19 April 2025.

We have participated in almost all cases involving the recognition of the rights of nature and its subjects, such as the Vermelho, Mosquito and Meia Ponte rivers and the Komi-Memen river in the Amazon; the Curral and Itambé mountain ranges, where the source of the Doce River is located, and the Foz do Rio Doce (Doce river mouth) wave, paving the way for the recognition of the rights of this river. It is important to remember that the Doce River was severely affected by the rupture of a tailings dam resulting from violent mining activity in 2015, in Minas Gerais.

As a result of these legal and regulatory developments, guardian committees were created by law, composed of members of local communities, including indigenous peoples, scientists and environmental managers, who represent these beings of Nature, giving them a voice and enabling them to operate legitimately within the Management Systems, so that they now occupy seats and participate in decision-making processes.

In 2024, we participated in a Public Hearing in the National Congress to present and debate the proposed Amendment to the Federal Constitution, developed in conjunction with the peoples during the Earth Assembly — constituted in accordance with the recommendation of the UN General Assembly (2022) — held during the 2nd Brazilian Forum for the Rights of Nature, in 2023⁸. The PEC (Proposed Constitutional Amendment) is signed and led by federal deputy Célia Xakriabá, an indigenous member of the Xakriabá people, and incorporates all the principles we have been advocating through the UN's Harmony with Nature program⁹.

The Rights of Nature emerge as an innovative and necessary ancestral approach to rethinking and restructuring the relationship between humans and nature in the face of the notorious ecological and climate crisis, proposing an eco-centric model of governance that recognizes the wholeness of Nature, where the principles of interdependence, complementarity, reciprocity and cooperation prevail among all that constitutes it — human beings and more-than-human beings.

Given the primary function of the law to serve as a guide for the values conceived by a society, and considering the ecological citizenship in which we live our lives together¹⁰, the legal system has proven itself, since the advent of the Federal Constitution of Ecuador (2008), as an effective means of promoting the recovery of ancestral knowledge that human beings have unwittingly lost.

8 Learn more at: <https://forumdireitosdanatureza.org.br/>. Accessed on: 19-Apr-2025.

9 Learn more at: www.harmonywithnatureun.org.br. Accessed on: 19-Apr-2025.

10 On the basis for formulating a concept of ecological citizenship, see the Papal Encyclical *Laudato si*. (Pope Francis, 2015)

A NEW DESIGNATION TO PROMOTE SUSTAINABLE DEVELOPMENT: ESG - ENVIRONMENTAL, SOCIAL AND GOVERNANCE

2004, a new global study was produced, *Who Cares wins*¹¹, this time led by male forces in the financial system, around the UN Global Compact. A new attempt, based on the same principles, marks the launch of ESG's global policy.

With goodwill and understanding that systemic changes take time, we began to investigate whether we could take advantage of the new wave in an attempt to find balance. According to systems theory, there is nothing like operating transformation from within. At first glance, we were struck by the feminine expression of care based on study and the introduction of the governance perspective.

Care is a central theme of the Encyclical "Laudato Si", mentioned above, which has as its subtitle "on care for our common home." It is also the theme of the entire work of one of the most influential thinkers from a mother-centered perspective, Leonardo Boff. The author describes care as a prerequisite for a paradigm shift capable of keeping us alive (Boff, 2002).

In his book *Saber Cuidar* (Knowing How to Care), Boff distinguishes between a life lived in harmony and an unsustainable life, based on the dichotomy between the values of Care and Work. He states that reviving the natural human inclination to care for others, which has been evident since the days when food was shared — "Being Cared For" — may be the path to a different economy, as opposed to the current one, which considers "Being Work" to be more valuable, inclined towards the competitive obligation to promote the market economy. Thus, the ecological crisis, which is also a human crisis, is justified by the exacerbation of the latter hypothesis, which involves the triad of work/production/consumption.

It was these fundamentals that led me, as a senior, to focus on Pope Francis' proposal, following the publication of the "Papal Ecological Letter", for young people to come together and discuss a different economy. During the Economy of Francesco event, participating in the "Work and Care Village," we were able to bring and receive light to include the concept of care in its broadest form, a value that has allowed us to sprout, survive, and thrive on Earth.¹².

11 Available at: <https://documents1.worldbank.org/curated/en/280911488968799581/pdf/113237-WP-WhoCaresWins-2004.pdf>. Accessed on: 19-Apr-2025.

12 Check out the Economy of Francesco webinar in which this author discusses the topic, available on YouTube: <https://youtu.be/TLWtxexOwb0>. Accessed on 22 April 2025.

For the report, which advises winning through care, the message is clear. But this time we can, or rather, we must, delve deeper into the concepts behind these new tools and invoke real care, with Nature as our teacher, inspiration and ally.

We will begin by seeking to understand the very concept of governance as one of the three pillars of the new market economy order for a new sustainability. As we have demonstrated earlier in this brief essay, this concept is based on an alliance with Nature, whose governance is oriented towards the promotion of life, the whole of life.

Humberto Maturana, a Chilean biologist who recently passed away at the age of 99, developed extensive work throughout his long life on the biology of love. He argued that all elements of this complex system of life are inexorably inclined towards the energy of love, that everything that makes up the Earth is destined to come together, and that everything that constitutes it is geared towards promoting and maintaining life. From there, Maturana stated that Darwin's Theory of Evolution was misinterpreted by science and social systems, whose values and actions, under the justification that in Nature the strongest wins, led to the adoption of ways of existing and doing things destined for pure competition, without the truth that the apparent defeat, subjugation or death of any of the elements of Nature has a single objective, namely, to promote the maintenance of life as a whole.

ESG comes as a kind of higher level and instrumental tool for global policies on sustainable development. In this sense, it carries in its principled and perhaps marketing basis the value of competition — winning. Let us hope that the trophy will be for overcoming the imbalance caused by unsustainable human intervention in other beings in Nature.

To succeed in this endeavor, governance must be inspired by Nature, which we must invite as an ally in this new attempt to bring true sustainability to the world. Although still based on market logic, which implies producing more, having more, and winning over others, ESG brings with it the value of care, which must be adopted in all relationships maintained around the functioning of institutions and corporations, inside and outside them, human and more than human, with the premise that all action must be geared towards maintaining life on Earth and the Earth itself.

Nature-based solutions, based on biomimicry studies, have had a significant impact on various sectors. The most emblematic and illustrative examples are in engineering, design and art.

This is the case with solar panels made from algae collections, minimizing the impact of disposal and recycling of traditional solar panels.

Figure 2. Sustainable energy generation from living freshwater photosynthetic filamentous macroalgae *Pithophora*¹³



Or the lamp that generates light with half a liter of salt water, benefiting traditional coastal communities.

Figure 3. A lamp that generates light for 45 days with half a liter of salt water.



In our organization MAPAS, biomimesis was used for social transformation through the legal system. Bioinspired by the lifestyles of indigenous peoples, who, aware of the inseparability between themselves and other beings, live in perfect harmony with Nature.

¹³ Source: <https://www.sciencedirect.com/science/article/pii/S2468217924000054?via%3Dihub>. Accessed on: 22-Apr-2025.

Thus, we understand that the promotion and application of the Rights of Nature must be based on the principles of life itself. Based on the fact of interconnection and interdependence, understanding the reality of complementarity, reciprocity and cooperation.

HOW TO ESTABLISH THE BEGINNING OF A PROCESS THAT RESULTS IN THE ARRIVAL OF A POSITIVE TIPPING POINT?

And where does the action begin?

It starts, for example, by placing Nature at the core of institutional planning, granting it a seat on the highest administrative body so that advice can be sought to integrate decision-making at all levels, from the bottom to the top, adopting values that are in line with the principles of Nature to establish a form of governance that is no longer focused on winning in the market through care, but rather on defeating the destruction of the Earth system through care; on winning with Nature as an ally.

From this macro perspective, environmental and social actions will be well positioned, making up an ESG or any other tool in an integrated and bioinspired manner.

More than that, and referring to the intelligence of plants that have enabled us to live on Earth by producing oxygen through their unique photosynthesis processes, perhaps one day — long enough after these first attempts to recover our original knowledge of living in communion with others, humans and more than humans — we will learn to vegetate and thus reforest the Earth.

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SUSTAINABILITY AS CULTURE: RESPECT FOR THE DIVERSITY OF WAYS OF LIVING IN BALANCE WITH NATURE AND THE PLURALITY OF LIFE FORMS

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ABSTRACT

The aim is to reflect on the scope of sustainability in the context of substantial deterioration socio-environmental issues, which mainly affect more vulnerable population groups, causing land exploitation, species extinction, among other aggressions. The socio-environmental agenda requires a mindset anchored in the cultural dimensions of what sustainability means in different territories, in which social arrangements understand the interrelationship with nature. From this perspective, the cultural dimension of sustainability gains in density, as it presupposes respect for the diversity of all forms of life, the principles of democracy and the elimination of inequalities and prejudices, combined with the right to a healthy environment. In a subsequent exercise, some actions and lessons learned within the scope of Sesc SP will be taken in the challenge of promoting sustainability in different areas and fronts of action.

Keywords: Sustainability. Education for Sustainability. Culture. Nature.

We think “homogeneously” about nature when we think about it without thinking about thought or about sensory apprehension, and we think “heterogeneously” about nature when we think about it together with thought about thought or about sensory apprehension or about both (Whitehead, 1994, p. 9).

When white people look at the forest, they never think about it. Even when they fly over it in airplanes, they see nothing. They must think that the ground and mountains are just there for no reason, and that it is nothing more than a large number of trees. However, shamans know very well that it belongs to the *xapiri* and that it is made from their countless mirrors (Kopenawa, 2015, p.121).

RECOGNIZING INTERDEPENDENCIES

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To those who have reached this point, a word of caution. The path outlined around the theme of Sustainability as Culture starts from an institutional setting, Sesc São Paulo, where it aims to foster dialogue between two aspects that are fundamental to the institution and, above all, to life. This comparative list highlights the respective dimensions — the limits and instrumental nature of the former and the breadth and complexity of the latter. Once the concession has been granted, it is important to identify cross-cutting issues that will enable a broader approach to sustainability².

In a broader sense, sustainability encompasses the condition of maintaining diverse forms of life, paying attention to the limits necessary to ensure life in balance, and the planet's capacity for regeneration. Moving from concept to practice involves revising the direction of development in contemporary societies, based on unlimited economic growth, which runs counter to maintaining the life cycles that sustain the plurality of life forms. It is a collective coexistence pact for cultural diversity and interdependence with nature (Sesc, 2024, p. 9).

Indigenous, traditional peoples and local communities continue to live in a relationship of interdependence with nature. The set of ideas and practices that encompass notions such as *sumak kawsay* (in Quechua), *suma qamaña* (in Aymara), *nhandereko* and *teko porã* (in Guaraní), or *Buen Vivir* reveal how fundamental the connection with nature is, associated with the effort to resist hegemonic economic systems which, historically and repeatedly, cause the depletion of natural life support systems. "In its first formal expressions, *Buen Vivir* crystallized in the new constitutions of Ecuador (2008) and Bolivia (2009) [as] a product of new political conditions, the presence of active citizen movements, and the growing prominence of indigenous peoples" (Gudynas, 2011, p. 463). Even with the establishment of a 'radical' form of interpretation and appreciation of nature (of the environment as a subject of rights) has been established, the obstacles to its implementation outweigh the struggle for these changes.

2 We would like to thank the technical teams from the areas of Food and Food Safety, Graphic Arts, Technical Planning Advisory, Audiovisual Production Center, Contracting and Logistics, Engineering and Infrastructure, Studies and Development, Heritage and Services, Health and Dentistry, and Sesc Digital for their collaboration in the systematization and careful analysis of the information that the Education for Sustainability and Citizenship area was able to rely on in producing the publication "*Sustentabilidade no Sesc SP: Ações e Aprendizados (2024)*" (*Sustainability at Sesc SP: Actions and Learnings (2024)*), which subsidized this article. We would like to thank our colleagues in the area of Education for Sustainability for reading and collaborating on the text.

Krenak drew attention to the difficulty contemporary societies have in recognizing the value of ancestral and traditional knowledge and in making collective commitments to life, when he reflects:

on the myth of sustainability, invented by corporations to justify their assault on our idea of nature. For a long time, we were lulled into believing that we are humanity. Meanwhile — while our wolf does not come — we have become alienated from this organism of which we are a part, the Earth, and we have come to think that it is one thing and we are another: the Earth and humanity (Krenak, 2019, p. 14).

Furthermore, reality presents a short time frame for reversing these threats. In 2024, Brazilian scientist Carlos Nobre said he was alarmed by ‘the highest temperature the planet has experienced in 100,000 years’ (Nobre, 2024)³ - the hottest year on record, with an increase of 1.5°C (34.7°F) compared to pre-industrial levels. Therefore, the socio-environmental agenda requires a perspective anchored in the cultural dimensions of what sustainability will mean in different territories (Sesc, 2024, p. 9).

Considerations to date point to a place of cultural-natural intersections from which Westernized societies, separated from nature, are increasingly distancing themselves. However, it is this place that guides the sense of community, of sharing knowledge and experiences focused on caring for people, cultural and biological riches, and respect for territories and different worldviews. If nature takes on a sense of totality - “everything is nature. The cosmos is nature. All I can think about is nature”, says Krenak (2019, p. 14), and the notion of culture “means understanding human nature itself, a perennial theme of tireless human reflection” (Laraia, 2001, p. 32). How, then, can we bring sustainability closer to this place of coexistence and the production of life?

Sustainability does not happen mechanically. It is the result of an educational process through which human beings redefine the set of relationships they have with the universe, with the Earth, with nature, with society and with themselves, within the established criteria of ecological balance, respect and love for the Earth and the community of life, solidarity with future generations and the construction of a socio-ecological democracy (Boff, 2015, p. 149).

3 See <https://www.estadao.com.br/sustentabilidade/crise-clima-seca-queimadas-amazonia-carlos-nobre/> Accessed on April 10th, 2025.

ACTIONS AND LEARNINGS

Seeking to give substance to this debate, albeit in broad terms, Sesc presents sustainability as a value at the national level⁴. The Regional Department of Sesc in the State of São Paulo - Sesc SP⁵, on the other hand, has been developing a philosophy on sustainability over the last few decades, alongside reflections on actions and lessons learned which, once refined, are implemented in specific but complementary areas and work fronts. In this context, sustainability is implemented across the board, from project design, construction, maintenance and facilities management to socio-cultural and educational activities, through the Assistance, Health, Education, Culture and Leisure programs. This mosaic of actions reaches different audience profiles — visitors to the units, Sesc employees — and engages in dialogue with the social agents with whom the institution interacts in the territories where each unit is located. The following are highlights of experiences in implementing sustainability at Sesc SP.

PATHWAYS FOR PLURAL COEXISTENCE

The commitment to social and environmental responsibility accompanies the design, construction and maintenance of the cultural and sports centers. Priority is given to low environmental and social impact construction, the protection of green areas, the responsible use of natural resources and the reduction of waste generation, with sustainable solutions that include easy-to-maintain materials. The installation of sewage treatment systems, solar heating, photovoltaic power generation, artesian wells and rainwater reuse are also included in the list of items dedicated to meeting sustainability criteria in projects and facilities.

Among the numerous examples, the renovation of the Sesc Bertiooga Holiday Center stands out, which incorporated the use of natural lighting in the accommodations, the installation of water and energy saving equipment, and the use of furniture made from reused wood (Sesc, 2024, pp. 16-21). The project renovated the landscaping by partially or totally restoring degraded ecosystems following the concept of ecogenesis, whose reference is Fernando Chacel (1931-2011), who worked on the restoration of degraded ecosystems, seeking to “reconcile” between the natural and the built environment, as can be seen in the image below (Sesc, 2024, pp. 31-32).

4 It deals with the incorporation of sustainability practices in a cross-cutting and integrated manner, cooperating with inter-institutional agendas and contributing to objectives common to society as a whole. See <https://www.sesc.com.br/institucional/o-sesc/missao-visao-valores/#>. Accessed on April 10th, 2025.

5 In 2025, there will be 43 Operational Units.

SESC Bertioga



Source:Fotonativa

In recent years, Sesc has sought certification for sustainable construction. The Sorocaba, Birigui, Avenida Paulista, and Guarulhos units, as well as the CEDEI (Child Development Center), were awarded the LEED (Leadership in Energy and Environmental Design) certification. And the future Pirituba and São Bernardo units will be certified with the Aqua Sustainable Construction label. Sesc Birigui and Sesc Avenida Paulista were awarded the Procel Edifica label, which recognizes buildings with the best energy efficiency (Sesc, 2024, p. 23).

EXPERIENCES THAT FLOURISH: CONSERVATION OF GREEN AREAS

The network of SESC units in the state of São Paulo has more than 4.6 million square meters of natural areas. These areas called *Espaços Verdes Educadores* (Educational Green Spaces) are largely found in the vegetation that makes up the Sesc Bertioga Holiday Center, but also in several units, in their flowerbeds, gardens, composters, worm farms, herb gardens, agroecological vegetable gardens, woods and avenues, orchid gardens, orchards, Agroforestry Systems (SAF), trails, plant nurseries, interactive naturalized spaces, green walls and roofs. These spaces foster coexistence between people, interactions with nature and highlight attributes of local biodiversity - one of them being the provision of ecosystem services that influence the quality of water, air, the balance of the urban microclimate, noise reduction, soil permeability, the expansion of biodiversity, the guarantee of habitat and food for fauna and the diversification of urban landscapes (Sesc, 2024, p. 30). These premises are included in the *Florestar: Áreas Verdes Educadoras* (Florestar: Educational Green Areas)

line of action, which highlights the educational potential of green areas through sensory and emotional experiences, stimulating connections between people and between people and the environment in a pleasant, critical and creative way.

In the context of conservation, the Sesc Bertioga Nature Reserve was created with 60 hectares of tall restinga forest in the Atlantic Forest biome, in the urban area of the city. It promotes scientific research, low-impact tourism and educational immersion experiences on the Trilha do Sentir (Trail of Feelings), developed with accessibility features and a flat, suspended 960-meter trail through the forest.

Reserva Natural Sesc Bertioga



Source: Sesc collection

WATER: A COMMON GOOD

Concerns about the responsible use of this natural resource arose in the 1980s with the construction of Sesc Itaquera, which employed solutions to reduce water and energy consumption given the partial coverage of water, energy, and sewage in the region. Sesc Vila Mariana already had a pressure control system for its taps in the washbasins since its inauguration in 1997. Units opened from 2000 onwards now have rainwater collection and reuse systems for use in flush valves, taps for washing outdoor areas and parking lots, cooling towers for the air conditioning system, and garden irrigation. (Sesc, 2024, p. 46). In the context of the 2014 water crisis, Sesc launched the Responsible Water Consumption Program, contributing to expanding solutions and improvements for efficient water use in its units.

Water for the Sesc Bertioga Holiday Center, for example, is sourced directly from the Serra do Mar mountain range via a network of pipes running through the forest to the Unit, where it is analyzed until it is fully purified and safe for consumption by the visitors of the Unit (Sesc, 2024, pp. 42-43).

Trilha da água



Source: Juan Pablo Silvio Dutra

At Sesc Guarulhos, rainwater is collected on the roof of the building and, after treatment, is used in the garden irrigation system, in toilets and urinals (Sesc, 2024, pp. 42-53). The Bertioga, Birigui and Guarulhos units adopt their own Sewage Treatment Plant (ETE) systems when public systems are insufficient. Responsible practices are part of the Oral Health programme, which carries out responsible disposal of healthcare waste and has been expanding the use of techniques that generate less material waste and lower water consumption, with cutting-edge technologies that reduce energy consumption. Finally, with the Drinking Water Campaign, Sesc suspended the sale of still water bottles in cafeterias at all Sesc units on March 1st 2020, in order to eliminate the generation of this plastic waste, ensuring free access to safe, high-quality water and representing a reduction of approximately 2 million plastic containers discarded per year.

RENEWABLE ENERGY

Sesc has more than one million square meters of covered and uncovered built area, serving an average of 15 million people per year. In order to maintain its commitment to responsible energy use, Sesc Technical Standards were created and are applied by the technical engineering team in the design, construction, and operation of the units. To keep track of energy use in the units, they set up the Efficient Electricity Use Program (together with the Responsible Water Use Program), which cut electricity use by 10% a year (study from 2016 to 2019), saving around 15,000 KWh — enough energy to supply all units in the state for four months (Sesc, 2024, pp. 56-65).

Some actions are worth highlighting. Sesc Vila Mariana demonstrated efficiency in the process of using waste heat from air conditioning systems to generate energy and heat the swimming pool water. Sesc Araraquara, opened in 2000, was a pioneer in the use of solar panels to heat water for bathing. Sesc Sorocaba has achieved international environmental certification for its green building features. Sesc Guarulhos, with a built area of 34,000 m², includes a high-efficiency air conditioning system, adequate thermal insulation, solar heating for bath water and swimming pools; an automation system to monitor and control energy consumption by sector and in real time; greater use of natural light, with savings of up to 50%. After undergoing renovations, the Sesc Bertioga Holiday Center recorded energy consumption 9% lower than the historical average, with the inclusion of measures for efficient energy consumption, such as: a hybrid water heating system (electric and solar) capable of heating water with sunlight for around 60% of the time it is in operation; the use of around 956 solar panels; use of LED lamps throughout the building; use of central air conditioning systems in the restaurant and administrative building of the Unit, consisting of water-cooled chillers; sloped slab with upper openings in the apartments and balconies, keeping them at a pleasant temperature.

Sesc Sorocaba



Source: Pedro Vannucchi

FOOD AND SOCIAL AND ENVIRONMENTAL RESPONSIBILITY

Sustainability is present across the Food and Food Safety area: in the principles of economy to minimize losses and waste generation; in the use of durable utensils and, when necessary, disposable ones; in the purchase of regional and local ingredients; in the reduction of food waste during production; when, in 2018, it stopped offering plastic straws, anticipating State Law No. 17.110/2019⁶; or with technologies to reduce water and energy consumption used in food production areas (Sesc, 2024, pp. 68-70). Based on the principle that “adequate and healthy food is a human right and must be guaranteed to all people” (Sesc, 2024, p. 71), Sesc Mesa Brasil was created in São Paulo in 1994, at the time named Mesa São Paulo. The program works through partnerships with companies, producers and other entities that donate food, which is sorted and separated by type and state of conservation and distributed to charitable organizations registered and previously verified by Sesc Mesa Brasil, which, in turn, assist people in situations of social vulnerability, such as needy families or support institutions. Associated with this virtuous cycle of sustainability,

6 Prohibits the supply of plastic straws in the State, among other provisions. See: <https://www.al.sp.gov.br/repositorio/legislacao/lei/2019/lei-17110-12.07.2019.html> Accessed on April 10th, 2025.

educational activities on good practices are carried out for those involved. Socio-educational projects such as *Experimenta! Comida, Saúde e Cultura* (Try it! Food, Health and Culture) and *Do Peito ao Prato* (From Chest to the Plate) address sustainability from various dimensions of food, such as organic and agroecological production or the use of unprocessed and pesticide-free foods (Sesc, 2024, p. 73).

Truck from Sesc Mesa Brasil



Source: Mirella Ghiraldi

RESPONSIBLE CONSUMPTION

With a focus on social and environmental responsibility, the procurement of each piece of equipment, material or service that serves one or more Sesc units — and the choices that guide it — is based on ensuring a good relationship between quality and price, considering institutional interests, product life cycles and environmental impacts. Among the numerous processes, the following stand out: the signing in 2015 of a loan agreement with suppliers of returnable plastic boxes, which generates savings of approximately 11,000 cardboard boxes per year; the implementation, starting in 2021, of the Contracting Portal for suppliers and cultural professionals, which eliminated the use of paper in administrative processes; the stimulation of the local economy, exemplified by the fact that 72.3% of contracts in 2023 involved at least one supplier from the

region covered by the units⁷; the adoption of digital credentials and the implementation of reverse logistics, with the collection and return of physical credentials to the supplier for the manufacture of new credentials. Finally, the introduction of conditions for suppliers to adopt sustainability practices has encouraged the formation of a sustainable supply chain.

Graphic processes now include, for example, printing with latex ink technology (solvent-free); the identification of suppliers that use products based on vegetable oils and 0% VOC (Volatile Organic Compounds); and the hiring of certified printing companies that use certified paper (FSC or Cerflor label)⁸.

For cleaning, Sesc has adopted energy-efficient equipment that reduces water consumption and introduced the use of chemicals certified by the Brazilian Association of Technical Standards (ABNT). Noteworthy are the impacts of the 90% reduction in water use and the 92% reduction in the use of chemicals for this purpose across all units.

The Dentistry and Oral Health area has consolidated sustainability parameters with significant process changes, reducing and eliminating waste: implementation of the digital radiology system between 2008 and 2012; elimination of amalgam in 2010; adoption of deionizers (devices that remove ions and impurities from water) in 2011, which eliminated the consumption of bottled distilled water; instrument dryers that reduce the use of disposable materials; intraoral scanners that reduce the production of prostheses. Between 2016 and 2022, Sesc sought to be granted level 3 excellence certification by the National Accreditation

7 A study carried out by the Contracting and Logistics area in the first half of 2023 considered the number of purchasing and contracting processes with the participation of at least one supplier from the mesoregion where the requesting unit is located (Sesc, 2024, p. 79).

8 The FSC (Forest Stewardship Council) label guarantees that all paper production is made from planted forests, with forest management, without diverting river courses, concern for fauna and flora and chain of custody. Cerflor certifies sustainable forest management and the chain of custody of forest-based products, in accordance with the principles, criteria and indicators set out in the standards developed by the National Standardization Forum and integrated into the Brazilian Conformity Assessment System and Inmetro, the National Institute of Metrology, Quality and Technology (Sesc, 2024, p. 84).

Organization (ONA), which ratifies the sustainable actions of Dentistry at the Sesc Santo Amaro Unit⁹. Finally, Sesc Dental Treatment Access Policy¹⁰ prioritizes care for the most vulnerable individuals.

CYCLE OF MATTER

Waste management — generation, reuse, recycling and disposal — is emerging as one of the major challenges of the contemporary world. To address this issue, Sesc SP implemented the *Lixo: Menos é Mais* (Waste: Less is More) program in 2010, inspired by the 3Rs principle — Reduce, Reuse, Recycle — which advocates the non-generation, minimization and responsible management of waste generated in all institutional actions, integrating administrative, operational, infrastructure, logistics and programmatic dimensions, with the establishment of a Management Group responsible for waste management in each unit. Measures related to waste management are guided by an educational perspective, learning for collective transformation, and involve both internal and external audiences. Among the dozens of measures adopted, the following stand out: elimination of individual trash cans and installation of collective disposal stations for recyclable and non-recyclable waste; elimination of disposable cups and bottled water, with the provision of durable utensils for people linked to the institution; elimination of tray liners, cutlery bags, sauce and seasoning sachets, straws, among others; the adoption of air hand dryers to replace paper towels in changing rooms and restrooms; weighing of all waste; collection and shipment of batteries for treatment; shipment of fluorescent lamps for treatment at licensed companies; donation of recyclable materials and electronic equipment to partner sorting cooperatives; implementation of the Drinking Water program, which eliminated the sale of bottled water and provided a greater number of drinking fountains and purifiers in the units, with the adoption of returnable cups for the public. For waste recycling, Sesc has partnerships with cooperatives

9 ONA has sustainability and social and environmental responsibility as pillars of its management principles and employs an assessment method that seeks, through previously defined standards and requirements, to promote quality and safety in healthcare industry. To be certified, the institution must demonstrate that it uses standards defined by ONA. With accreditation, the following good practices were achieved in 2022: optimization of material use, reducing waste; planning for the acquisition of materials and supplies; good practices for receiving supplies by the warehouse with regard to their expiry dates; and preventive equipment maintenance procedures.

10 It is based on scientific studies produced or ratified by national (National Commission on Social Determinants of Health) and international entities (Commission on Social Determinants of Health – WHO and International Centre for Oral Health Inequalities Research & Policy).

and non-profit institutions in the state of São Paulo that collect and sort waste, generating income for people linked to the cooperatives that are partners in the program.

À Deriva (Jaime Prades) / Sesc Pompeia



Source: Lúcio Érico

Finally, it is worth highlighting the integration of sustainability into artistic projects, such as *Mirada — Ibero-American Performing Arts Festival (Biennial)*. Each edition involves several stages in waste management, from design and planning to finalization with responsible disposal.

EDUCATION FOR SUSTAINABILITY AND CITIZENSHIP: IDEAS AND ACTIONS THAT CONNECT

The critical reading of reality, a strategy for understanding the territorial dynamics in which the units are located, is one of the foundations of the line of action *Ideias e Ações para um Novo Tempo* (Ideas and Actions for a New Era), since 2012¹¹. Through educational activities based on participatory social action methodologies, the project carries out initiatives such as mapping socio-environmental initiatives that stand out for their positive impact on their communities; mentoring, such as the Citizen Laboratory; collective efforts to implement sustainable technologies; fairs and exhibitions that value traditional knowledge and disseminate nature conservation practices and sustainable technologies; and the development of

¹¹ To access: <https://sesc.digital/colecao/ideias-e-acoes>

educational content in different formats and languages in order to disseminate and circulate locally built ideas and experiences from a community perspective, highlighting the potential and expertise of the protagonists in their territories.

Socio-environmental Experiences in Green Spaces Educators at the units value direct contact with nature and are mediated by Environmental Education Agents¹². Sesc has three *Environmental Education Centers*. The first CEA of the institution is at the Sesc Bertioga Holiday Center (2008) and addresses the theme “Between the Mountains and the Sea”. The CEA at Sesc Guarulhos (2019) is dedicated to the theme “Territories in Transformation”, discussing urban occupation and biodiversity in the region. Its outdoor area features an accessible vegetable garden and flower beds. The CEA at Sesc Mogi das Cruzes (2021) addresses rural-urban relations, focusing on permaculture techniques, and has an outdoor area with structures for rainwater harvesting, a green roof, a root zone, rain gardens, and composters.

Environmental Education Center / Sesc Mogi das Cruzes



Source: Nando Bomfim

The *Florestar: Green Educational Areas* line of action aims to raise awareness and consciousness about the importance of green areas for socio-environmental balance and people's quality of life. There are tours, trails, guided visits, workshops and recreational activities that allow visitors to reconnect with nature. Connected to this line of action are the *Protected Natural Areas Management Course* (since 2019); the *Avifauna*

12 Sesc employs Environmental Education and Green Area Management Agents, who are responsible for handling and maintaining natural areas at the Franca, Itaquera, Interlagos, Pinheiros, Bertioga, Piracicaba, Santos, Sorocaba, Jundiaí, Taubaté, Birigui, Registro, Ipiranga, Guarulhos, Mogi das Cruzes and Thermas de Presidente Prudente units.

Project (since 1993), which deals with strategies for attracting local birds, associated with the publication *Aves de Bertioga* (Bertioga Birds), now in its third edition; the *Sesc Bertioga Nature Reserve*, already mentioned, which offers an educational program for guests of the Sesc Bertioga Holiday Center, visitors, student groups, and educators on guided tours that lead to an understanding of the territory in its local and global context, with the mediation of environmental education agents.

Trilha do Sentir / Reserva Natural Sesc Bertioga



Source: Júnior Castro

The *Waste: Less is More* program, in its educational dimension, carries out training activities and content production for internal and external audiences, such as: the free distance learning course *Consumption, Waste and Sustainability*¹³; the publication *Where Does Trash Belong?* and the educational guide *Transformative Stories*, which address the adoption of waste-related actions. the publication *Lugar de Lixo É Onde Mesmo?* (Where is the right place for trash?) and the educational guide *Histórias Transformadoras* (Transformative Stories), which address the adoption of waste-related actions. In addition to the aforementioned lines of work, the Sesc SP Education for Sustainability program takes on other possibilities for action that promote debate on the socio-environmental agenda through cross-cutting dialogues, such as: seminars, forums, debates, exhibitions, theater shows, musicals, audiovisual productions in digital media or in programs for Sesc TV. Similarly, specific but complementary areas such as Education for Accessibility, regarding access for people with

13 To access: <https://ead.sesc.digital/> See Consumption, Waste and Sustainability.

disabilities; Social Empowerment, which discusses income generation; and Social Tourism, which addresses Community-Based Tourism, are valuable connections that broaden perspectives in the socio-environmental debate.

OPEN PERSPECTIVES

After this brief overview, it can be observed that sustainability at SESC is associated with a continuous learning process, beyond its instrumental nature and compliance with legislation. Reflecting the central role that culture and education play in the institution as drivers of social change and transformation¹⁴, sustainability initiatives demonstrate a concern with addressing the challenges of the social and environmental agenda. A process in constant transition, requiring a change in attitude and the implementation of concrete actions that can mitigate these challenges. Being aware of changes in society is a strategy for staying alert to internal changes, such as the different contexts in which units are implemented, which ultimately bring about significant changes in the way the institution thinks and acts.

The implementation of technologies that favour the maintenance of life cycles and natural assets; a commitment to environmental conservation; the development of pedagogical methodologies and strategies that invite the public (both internal and external) to reflect and act on the transformation of the current context towards a more just and democratic society; opportunities to enjoy nature; the enchantment caused by direct contact with diverse artistic and cultural manifestations and expressions and, above all, guaranteeing the right to access such experiences by eliminating barriers and expanding accessibility are ways of responding to the challenges of the socio-environmental agenda. From this perspective, the possibilities of strengthening the cultural dimension of sustainability are also expanded.

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14 See <https://portal.sescsp.org.br/pt/sobre-o-sesc/transparencia/realizacoes/> 2023, p.11. Accessed on April 10th, 2025.

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THE LEGACY OF BRAZILIAN AGROBIODIVERSITY AND THE FOOD OF THE FUTURE

Gabriela Narezi¹

ABSTRACT

The loss of traditional knowledge associated with biodiversity results in the increased dependence of modern societies on economic models and industrial agricultural production systems, implying the loss of agrobiodiversity and, ultimately, the loss of food sovereignty. In recent years, productivity gains from technological revolutions in agriculture have been significant, to the point of reducing the price of certain foodstuffs. However, this fact did not guarantee access to healthy foods with high nutritional content. Furthermore, conventional agriculture has become one of the main diffuse sources of pollution and is also responsible for habitat loss on the planet. On the other hand, there is the emergence of a route that leads to sustainable and resilient production practices, seeking to bring together biodiversity conservation strategies, food production and social inclusion within the same ecosystem.

Keywords: Food safety. Agroecology. Productive inclusion. Bioeconomics. Biodiversity Conservation.

AGROBIODIVERSITY IN HUMAN EVOLUTIONARY HISTORY

Debates about human evolution are heated and give rise to thought-provoking reflections on cultural processes, adaptability and human development. According to Kormondy and Brown (2002), human populations, throughout the evolutionary process, migrated, underwent changes in the quality and items that make up their diet, or changed the way they obtain resources. Such changes were and still are considered strategic in the face of seasonal fluctuations in the environment, with implications for the way human populations socially organize themselves, with adaptation consisting of biological and sociocultural processes.

Human survival strategies have become increasingly sophisticated, complicated by the development of culture and contact between people from different cultures. In addition, ecosystems have undergone numerous climate changes, directly affecting the food supply of human societies. The complexity achieved by ancestral societies and their wealth of

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knowledge about biodiversity can assist in the extensive process of reconstructing human history, interpreting current landscapes, and planning future scenarios.

The first manifestations of what we call agriculture (cultivation of the land and domestication of plant species) and animal husbandry (domestication of animals) date back more than ten thousand years, along with the formation of the first agricultural villages (Ehlers, 1999). During this period, the use of some tools and animal manure had already been developed, and humans carried out thousands of empirical selections on cultivated plants according to their various needs.

The prefix *agro* comes from the Latin word *agru*, which means cultivated or cultivable land. The word culture also comes from Latin and means to care for. Haudricourt and Hédin (1987, p. 85) refer to agriculture as *la mise en terre volontaire*, i.e. voluntary planting with a view to obtaining a considerable quantity of products for human use. Haudricourt and Hédin (1987) consider that constant human intervention in a given ecosystem is necessary for the survival of cultivated plants in the context of natural selection. Otherwise, in the process of natural selection, they could disappear.

The authors emphasize that there is a relationship of interdependence, since cultivated plants played a key role in human evolution, enabling humans to elevate and refine their way of life. Thus, human beings subjected animals and plants to their needs. Genetic selection over the years has caused plants and animals to differ from their geographical environment of origin and diverge from the characteristics found in individuals found in nature.

It should also be considered that, in general, living beings are constantly exchanging matter and energy with their ecosystem, and therefore this is not a static process. It should be noted that the main plants that provide food for humans are those that accumulate energy reserves. In the plant kingdom, cultivated plants form a separate group, characterised by their ability to produce products that are useful to humans, either as food (sugar, starch, oil, etc.) or as raw materials for industry and technological development (fibres, wood, dyes, pharmaceuticals, etc.) (Haudricourt; Hédin, 1987).

Throughout history, many cultivated plants have been somehow replaced by others according to changing interests in the context of the development of societies. The application of the term “cultural forests”, presented and discussed by several authors (Posey, 1985; Adams, 1994; Clement, 1999; Balée, 2006; Diegues, 2004; Ângelo Furlan, 2006), is used to characterize practices of occupation of natural ecosystems in formation

by traditional and indigenous populations, constructing in this process a type of coevolution, also called domesticated landscape. Traditional and indigenous management of a forest ecosystem can be transmitted from generation to generation and can combine rotational agricultural practices, collection of forest resources, hunting, fishing, among other activities that can provide management of the territory, access to food and management of local biodiversity.

Such practices can cause interference over time, and forest scenarios that are seen today may be the result of the most diverse forms of intervention by ancestral populations. Thus, current landscapes, ecosystems and their dynamics can provide clues for investigating management models for these ecosystems, which can be called agroecosystems. Thus, in a cultural forest, there are not only botanical species, but also a meaning and function for each individual according to the rationality matrix and/or paradigm from which the management objective originates (Diegues, 2000).

Clement (1999) considers that indigenous populations prior to the arrival of European colonizers had reached advanced levels of domestication of species cultivated for food and other uses, transforming the Amazon into one of the great centers of biodiversity of cultivated species at that time (Clement, 1999).

In this sense, the term sociobiodiversity is adopted in this work, seeking to represent the congruence of several factors related to ethnoknowledge, natural resource management mechanisms, agrobiodiversity and cultural diversity promoted by traditional populations and communities of family farmers.

Along with the loss of ethnoknowledge about the management of sociobiodiversity, there was also a significant introduction of exotic species (species of plants, animals and microorganisms) during the period of colonization of Brazilian territory. Successively throughout the various periods of colonization, these insertions refer to species from different regions of the planet, either through the arrival of useful, food and productive species, or through dispersion caused in a way that was not foreseen or planned by the colonizers.

There are examples of management of local species, as well as the introduction of exotic plant species during this period, which allowed for considerable food enrichment. For example, Afro-descendant communities in the Americas have maintained practices of domesticating species in small farms for their own consumption. By the way, Josué de Castro (2001) considers Black men (enslaved or fugitives from large farms) to be resistant to the monoculture of sugar cane in the sugar-producing Northeast. They are a people with an agricultural tradition, focused on “subsistence agriculture” (Castro, 2001).

Disobeying the master's orders and secretly planting his little plot of cassava, sweet potatoes, beans, and corn, [the Black man] stains the monotonous green of the sugarcane fields here and there with different stains from other crops. Blessed stains that save the region's food monotony (Castro, 2001, p. 48).

The influence of Portuguese colonizers, Italian and Japanese immigrants was also significant in terms of dietary patterns and the direction of agricultural production in Brazil. It can be considered that the culture of colonizing peoples, notably Mediterranean cuisine, has influenced and continues to influence the eating habits of Brazilians to this day, causing native crops originating from traditional cultures to be neglected both in local food structures and in large-scale production processes and markets.

Genetic erosion, the erosion of traditional knowledge associated with biodiversity, as well as the introduction of exotic species have resulted in modern societies becoming increasingly dependent on economic models and industrial agricultural production systems, leading to a loss of nutritional quality in food and, ultimately, a loss of food sovereignty.

THE INDUSTRIAL AGRICULTURE MODEL AND FOOD STANDARDIZATION

Completely different agricultural and cultural practices can be found in different parts of the world, forming a kind of "evolutionary series" that represents the transformation of agriculture around the world (Mazoyer, 2010).

According to Mazoyer (2010), the period of European maritime expansion enabled the enrichment of European agricultural systems with new food varieties, the result of selection by traditional Amerindian peoples, such as corn – *Zea mays* (Mexico), potatoes (*Solanum tuberosum*), tomatoes (*Lycopersicum* sp) (in the Andean highlands), and strawberries (*Fragaria vesca* L.) (on Andean slopes).

As a result of the colonizing occupation, tropical regions (the Americas, South Africa, Australia and New Zealand) had an abundance of land and began to develop new production systems based on agro-export interests. From the 19th century onwards, culminating in World War II, technology and large corporate profits were based on the chemical and war inputs. With the end of the war, it was necessary to maintain the chemical industry by transferring and expanding the technological structure to other sectors, notably agriculture. In this sense, there was more and more incentive to increase agricultural productivity with the ideological discourse of seeking to end world hunger.

It was necessary to feed the large urban masses, who were attracted from the countryside to the city by the jobs on offer in the new industries. The development of mineral fertilizers, chemical fertilizers, and the use of machinery and tractors dependent on the petroleum energy matrix increasingly served the market interests of the time. Thus, conventional agriculture has become the main diffuse source of pollution. This was largely due to the lack of a more comprehensive view between the productivity and stability of tropical ecosystems. Ecological conditions were revolutionized by the simplification and specialization of ecosystems explored by agriculture (Veiga, 2003).

In the 20th century, productivity gains resulting from the agricultural revolution were significant enough to reduce the price of certain agricultural products, but the production practices employed put human and environmental health at risk. In 1962 there was a historic milestone in the USA, with the publication of the book *Silent Spring*, by Rachel Carson (1962). In this work, the author presents the environmental concerns arising from the high use of synthetic pesticides and strongly criticizes the use of DDT, culminating in the prohibition of the use of this and other products in the country. Together with the work of several environmentalists, the Environmental Protection Agency was later created, which began to regulate polluting activities in the country and to this day is considered a world reference in pollution control.

More recently, new techniques have emerged to respond to the need to reduce the use of chemical inputs in agriculture, such as those used in precision agriculture, which rely on high-cost technological devices. The discourse based on the sustainability of agriculture based on GMOs (Genetically Modified Organisms) is increasingly questioned and is gaining great attention in international political arenas. For Dufumier (2011), this transgenic industrial agriculture is based on the logic of economies of scale, as it establishes a reduced number of food varieties. These varieties, produced in large-scale monoculture systems, most often in degraded ecosystems, can trigger the imbalance of numerous trophic, behavioral and reproductive processes of the living organisms involved in them.

ECOLOGICALLY BASED AGRICULTURE - PLANTING FOR THE FUTURE

It can be considered that ancestral cultural practices influenced new trends in alternative and ecologically based agriculture practiced in the West. India's ancient agriculture uses animal manure as the main basis for soil fertilization, along with organic matter, ash and herbs. This technique was observed by English agronomist Albert Howard over a

period of three decades. Later, this author published the work “An Agricultural Testament” (1940), giving rise to the movement known as Organic Agriculture.

In France, the Organic Agriculture movement proposed by Claude Aubert, who published “*L’agriculture biologique: pourquoi et comment la pratiquer*” (1974). It can be considered that in European countries, based on democratic spaces for debate, initiatives to demand regulation of certain production processes have grown as a result of demand from consumers themselves. Thus, as the European population became aware of the negative impacts of conventional agriculture on the environment and human health, initiatives were taken and market demands were created.

Currently, both Organic Agriculture and Biological Agriculture are recognized in several countries as productive practices that do not use chemical inputs, such as: fertilizers, insecticides, pesticides and transgenic seeds. These production practices seek to develop technologies adapted to agroecosystems, incorporating natural resource conservation practices. In other words, they make use of elements common to other types of alternative agriculture, such as composting, green manure, the rational use of water, soil conservation practices, among others.

In order to regulate the markets for products originating from alternative production practices, the International Federation of Organic Agriculture Movements (IFOAM) was created in 1972, and went on to develop certification labels that guarantee the quality of the production process. It can be considered that the different alternative farming systems are becoming increasingly standardized, seeking a higher level of insertion in conventional markets, but still with difficulties in guaranteeing access to a greater number of consumers, due to its high cost.

In response to the criticism of the social aspects of the organic and biological production process, the concept of solidarity economy and fair trade was introduced into the markets, mainly in European countries. The International Fair Trade Association currently has around three hundred associations from sixty countries and enables fair trade between organic producers, mainly from tropical and developing countries, with companies and distribution centers in developed countries.

Unlike the previous European examples, another trend of alternative agriculture was developed in Germany, with strong philosophical ties to the foundations of Anthroposophy proposed by the philosopher Rudolf Steiner. This is the basis of biodynamic agriculture, which proposes a systemic approach, understanding the farm as a living organism, and the presence of cattle as essential to the balance of this system (Khatounian, 2001).

Annual lunar calendars applied to agriculture are developed, in addition to the preparation of biodynamic preparations according to the periods and needs of the agroecosystem. Steiner (1999) proposes something that goes beyond the simple process of compensatory fertilization of the soil, in which elements are inserted that only seek to recompose the nutrients extracted by the plants, he proposes vivifying the soil. Sixel (2003) reflects on the concept of soil vivification and considers that Ana Primavesi's studies have contributed significantly to this understanding.

The latter author presents the negative effects of mechanical soil preparation as the results of her research. In addition, she considers that the constant addition of woody material to the soil cover promotes the improvement of its physical and chemical structure. Covering the soil with woody material encourages the emergence of spontaneous plants, creating a living cover and a microclimate favorable to the fixation of micronutrients in the soil (Primavesi, 2001).

Between the 1930s and 1940s, natural agriculture emerged in Japan, which was developed within the philosophical-religious context of the Messianic Church. Natural agriculture stood out for using a differentiated soil fertilization system and for advocating the least possible interference with the natural functioning of ecosystems. It works on the development of "effective" or "regenerative" microorganisms, which act in the controlled fermentation process to produce a type of balanced compost made from organic materials of plant and animal origin.

According to Khatounian (2001), in Brazil, the initial diffusion of this method was linked to immigration and the formation of Japanese colonies, later constituting business frameworks for food production (for example, the Korin Industry – poultry production based on natural agriculture, pioneer in the creation of Antibiotic Free (AF) chicken, free of antibiotics and artificial growth promoters, trade and certification of production processes).

According to the conceptual interpretations developed in the academic field in recent years, agroecology presents a series of principles, concepts and methodologies that allow the study, analysis, design, management and evaluation of agroecosystems (Altieri, 1989). "In agroecology, the preservation and expansion of the biodiversity of agroecosystems is the first principle used to produce self-regulation and sustainability" (Altieri, 2000, p. 19). Thus, the aim is to facilitate the harmonious coexistence between biodiversity conservation and agricultural production in the same ecosystem.

Through the tools of agroecology, family farmers begin to act as protagonists in the transition to a sustainable economy, since, at the same time as they are producers of food and other agricultural products, they

play the role of guardians of the landscape and conservationists of biodiversity, corresponding to an alternative form of occupation of the territory, with social and environmental criteria (Sachs, 1993).

More recently, biodiverse agroforestry systems have been gaining notoriety, both among large landowners who are enthusiasts of regenerative agriculture and through collective actions applied to family farming, agrarian reform settlers and traditional populations. Currently, it is possible to find, in the Brazilian context, numerous production experiences that increasingly attract the attention not only of farmers and technicians, but also of public policy managers.

SAFs are considered here as “land use systems in which perennial woody species are intentionally used and managed in association with agricultural crops and/or animals in the same land management unit” (May; Trovatto, 2008) and present ecological and economic relationships between these components, constituting a sustainable alternative for occupying deforested areas and for cooperating in the process of restoring native forest heritage.

According to one of the pioneers and disseminators of experiences with agroforestry systems (SAFs) in Brazil, the Swiss Ernst Götsch, SAFs are “an attempt to harmonize human activities with natural life processes” (Götsch, 1997). For him, the agroforestry system is based on the successional process with the objective of creating more life: “The succession of generations and the natural succession of species is the pulse of life, the vehicle in which life traverses space and time” (Götsch, 1997). This represents the two principles for the functioning of the agroforestry system: “diversity” and the dynamic use of “natural succession,” where each species contributes to increasing the “energy surplus” (Götsch, 2002). Biodiverse agroforestry systems are sustainable forms of land use, as they increase soil fertility through the accumulation of biomass, maintain water balance and provide conditions for the development of local fauna and flora.

BIOECONOMY - THE ECONOMY OF THE STANDING FOREST

Studies on environment and society show that social inequality and high biodiversity in tropical ecosystems in Latin America generate socio-environmental conflicts regarding territorial management (Ângelo Furlan, 2006). In the context of Brazilian biomes, with emphasis on the Amazon and the Atlantic Forest, it can be considered that significant efforts are being made to conserve biodiversity, which seem to be centered on the preservation of still existing natural areas, with an attempt to control the expansion of an exploratory culture of territories promoted by large-scale conventional agriculture.

While there is pressure from environmental movements at the national and international levels to increase the number of Conservation Units, agricultural frontier areas are expanding across much of the country. In other words, the conventional Brazilian agro-industrial export model is expanding, notably supported by the expansion of extensive livestock farming and monocultures of sugar cane, soybeans and eucalyptus forestry in recent years. In both situations, whether in the expansion of the agricultural frontier or in the expansion of areas for biodiversity conservation, family farming, traditional peoples and populations are disregarded in the logic of land use and occupation in disputed territories, often being pressured to vacate rural territories.

In this sense, large-scale agriculture and livestock farming are intensified, areas are set aside for the integral conservation of ecosystems, but incentives for the integration of agriculture and nature are still very incipient. According to Chapell et al. (2009), this phenomenon is known as land sparing versus land sharing, undermining broader landscape matrix conservation efforts, as well as the development of traditional populations and family farmers. Indeed, the modernization of agriculture and the expansion of monoculture areas have had consequences for family farming, creating real social vacuums in rural and natural areas, directly interfering with the dynamics of food production in these regions.

Meanwhile, recognition of the importance of agrobiodiversity has become essential for promoting social inclusion and sustainable development, seeking to link food production with biodiversity conservation.

Currently, there are various initiatives to strengthen the National Bio-economy Strategy within the scope of public policies and private initiatives, seeking to value traditional knowledge, recover native genetic materials, promote social participation, and strengthen community organization. Support can be seen for the development of projects promoting native plants of current or potential value; the use of biodiversity for nutrition, health, and food security; and the promotion of community use of medicinal plants and herbal medicines as a strategy for valuing and promoting the sustainable use of biodiversity (Ministry of the Environment, 2006).

Among megadiverse countries, Brazil has the greatest diversity of native plants and a wide variety of cultivated plants. This genetic heritage constitutes the food base and source of raw materials for countless activities carried out by local populations. It is also an organizing element of specific cultural contexts. Conserving it, therefore, is a fundamental task for the food security of these populations and for the preservation of the associated cultural heritage. The genetic diversity component, managed by traditional populations and family farmers, preserved in

the field and by the farmer, is the result of a long and diverse selection process, adapted to the local reality. Despite its importance, it lacks recognition and special efforts aimed at its conservation and appreciation (Ministry of the Environment, 2006).

It is in this context that biodiverse SAFs and agroecological production arrangements can be considered as productive strategies for agriculture and for timber and non-timber forest resources. In addition, they are also considered strategic for the recovery of degraded soils, forest restoration and the formation of ecological corridors, enabling the promotion of ecosystem services and biodiversity conservation in the rural landscape. However, there is a clear need for greater investment in scientific, technological and innovation development so that such production systems can achieve scale. Furthermore, there is a need to ensure that such proposals are developed in an inclusive manner, seeking to eradicate poverty and inequality in access to natural resources.

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PAYMENT FOR ENVIRONMENTAL SERVICES (PES): CHARACTERISTICS, EXPERIENCES AND PERSPECTIVES IN THE CLIMATE EMERGENCY SCENARIO

Natália Jodas¹

ABSTRACT

Payment for Environmental Services (PES) is an economic instrument present in various Brazilian environmental policies and, since the late 1990s, has developed in a diverse and widespread manner throughout the national territory. Aiming to provide an objective and accessible overview of this instrument, the present work contextualized PES within the existing legal framework, unpacked key concepts related to the topic, and clarified how these initiatives have taken shape in Brazil from the perspective of the stakeholders involved. Additionally, it presented Federal Law n. 14.119/2021, the main regulatory framework at the federal level, along with the updated state-level regulatory landscape on the subject, with the goal of more accurately reflecting on the potential contributions of PES to addressing climate change. This includes an analysis of the program “Extrema no Clima,” a variant of the “Conservador das Águas” (Water Conservation) project, one of the oldest municipal PES initiatives in Brazil. The research methodology adopted was a national and international literature review combined with a document analysis based on state legislation databases relevant to the topic.

Keywords: PES. Environmental Services. Ecosystem Services. Legal Framework. Climate Change

INTRODUCTION

The need to reconcile new strategies for promoting environmental preservation with traditional command and control instruments, the difficulty of complying with the old Forest Code (Law No. 4,771/1965), the growing debate on assigning value to services provided by nature, among other aspects, led to the emergence of Payment for Environmental Services (PES) at the end of the 20th century. In the Brazilian context, although

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lacking specific federal regulations until 2021, PES was adopted by many municipalities and states as a means to conserve priority conservation areas, restore important water sources, or even keep forests standing.

Numerous criticisms have been made along the way, ranging from questions about payments to meet legal obligations to the way certain experiences have been implemented, particularly in the Amazon, especially regarding the decision-making power of indigenous peoples within REDD projects, which are a type of PES project. The fact is that the different characteristics of these projects and programs remain across the country, and it seems pertinent to discuss and highlight their features in order to facilitate new debates, paths and corrections.

Therefore, this work aims to portray PES in an uncomplicated and accessible manner, so that it can be situated as a legal instrument of Brazilian environmental policy, without losing sight of the basic conceptual elements and practical data on how these initiatives are being developed in the country. Thus, the first section sought to differentiate command and control instruments from economic instruments present in sectoral environmental policies, in order to facilitate understanding of the PES as an instrument for inducing behavior. This section also addresses the concepts of ecosystem services and environmental services, and then explains how PES initiatives have been coordinated, the composition of these arrangements, the main actors involved, and their respective roles.

The federal and state regulatory frameworks on PES are addressed in the second topic, which maps the state laws directly and indirectly related to the topic, based on a document survey updated by the author in 2025. The last part focuses on the possible links between the PES and the fight against climate change, using the “Conservador das Águas” (Water Conservator) program in Extrema, Minas Gerais, as a practical case study to illustrate an experience that has incorporated climate change into the new direction taken by the project.

The research methodology used is a national and international literature review of studies published in books and journals, as well as institutional documents published on the subject. In addition, the document survey collected from state legislation databases on the subject was updated.

1. ENVIRONMENTAL POLICY, LEGAL INSTRUMENTS AND PES

Brazil environmental policy, inaugurated by Law No. 6.938/1981², established a series of instruments with the aim of seeking to preserve, improve and recover environmental quality that is conducive to life and to ensure, in the country, conditions for socio-economic development, the interests of national security and the protection of human dignity. Thus, Payment for Environmental Services (PES), as a tool of the aforementioned policy, coexists with other mechanisms aimed at the same purpose.

As in other areas of law, it is possible for the same policy to establish different types of instruments aimed at its implementation. We tend to think that law, in essence, routinely punishes behavior classified as crimes or violations of fundamental rights. It is not wrong to think this way, but it is a somewhat limited understanding, since there are reward sanctions within legal norms, that is, ways of encouraging behavior considered beneficial to a particular sector.

Therefore, contemporary law is not limited to a repressive concept, such as a coercive system, which establishes a necessary and indissoluble link between law and coercion (Bobbio, 2007, p.7). In fact, the current legal system has been shaped by a promotional function, with the aim of encouraging, facilitating or attributing pleasant consequences (*ibid.*, p.16).

Within this perspective, we note the coexistence of so-called command and control instruments and economic instruments in the field of environmental policy. The former are widely known by society, as they aim to establish rules, standards, procedures or limits for those subject to the norm, in order to ensure compliance with the policy in question, such as reducing air or water pollution and promoting the conservation of vegetation areas (Motta apud Nusdeo, 2006, p. 364). The latter, on the other hand, have an inducing nature towards behaviors desired by environmental policy, a character configured through the creation of taxes, public prices or subsidies (Nusdeo, 2006, p. 366).

For example, under the National Policy on Climate Change (PNMC)³, command and control instruments are quantifiable and verifiable environmental standards and targets for reducing anthropogenic emissions by sources and anthropogenic removals by greenhouse gas (GHG) sinks (Article 6, item XVII⁴), to which the recipients of the standard will be subject. The same law provides for financial and economic mechanisms, at the

2 Federal law that established the National Environmental Policy (PNMA).

3 Established by Federal Law n. 12.187/2009.

4 Art. 6 The instruments of the National Policy on Climate Change are: [...] XVII - the establishment of environmental standards and quantifiable and verifiable targets for the reduction of anthropogenic emissions by sources and for anthropogenic removals by sinks of greenhouse gases;

national level, related to climate mitigation and adaptation (art. 6, XI)⁵, as well as existing or future measures that stimulate the development of processes and technologies that contribute to the reduction of GHG emissions and removals (art. 6, XII)⁶, illustrating well the economic instruments discussed here.

Having made these brief distinctions, we return to the PES, which consists of an economic instrument aimed at encouraging, through monetary or non-monetary resources, human behavior considered beneficial to nature. Such behaviors are classified as “environmental services”, that is, actions by human beings capable of promoting improvements in the provision of services routinely provided by nature (ecosystem services). For a better understanding of PES, the next topic will clarify the concepts of environmental services and ecosystem services, since these terms are often confused both in theory and in the various practices undertaken on the subject.

1.1 UNRAVELLING THE ECOSYSTEM SERVICES OF ENVIRONMENTAL SERVICES

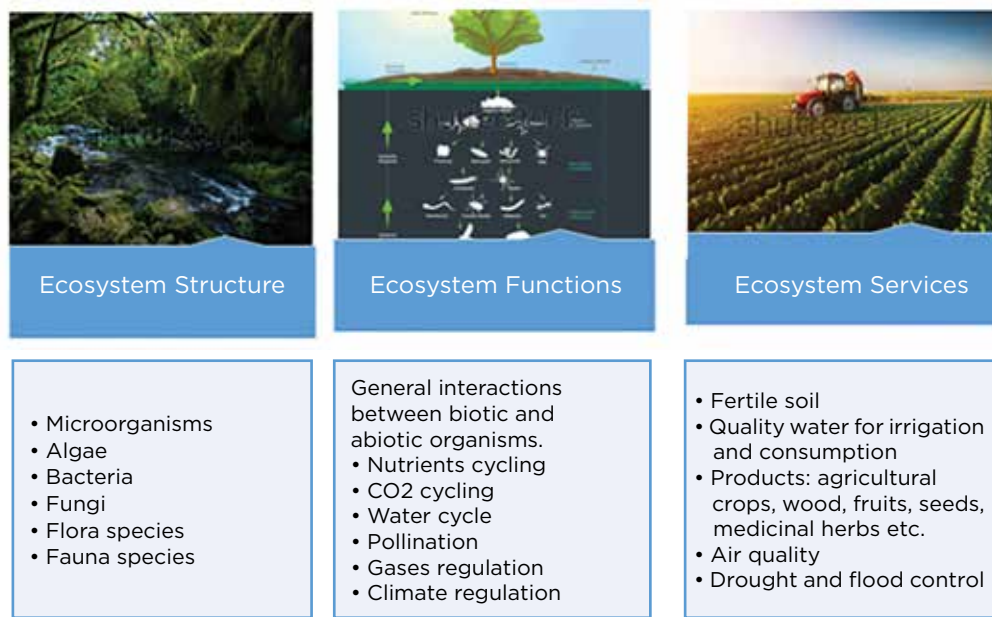
Herman Daly and Joshua Farley (2004, p. 130) teach that life on Earth is directly linked to the provision of ecosystem services. Thus, ecosystems are endowed with structures, that is, individuals and communities of plants and animals varying in degree and complexity. As these elements act and interact, they perform so-called *ecosystem functions*. These, in turn, can be illustrated by water filtration, rainfall, the carbon cycle, evaporation, temperature reduction, maintenance and reproduction of fauna and flora, the nitrogen cycle, among others. Therefore, ecosystem functions that are useful to humans are called *ecosystem services*.

According to the authors themselves (Daly, Farley, 2004, p. 141), we can say that humanity benefits from almost all ecosystem functions. Figure 1 helps to understand all the terminology used to understand ecosystem services:

Figure 1. Ecosystem structure, functions and services

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- 5 XI - financial and economic mechanisms at the national level relating to climate change mitigation and adaptation;
- 6 XII - existing measures, or those to be created, that stimulate the development of processes and technologies that contribute to the reduction of emissions and removal of greenhouse gases, as well as to adaptation, including the establishment of preference criteria in public tenders and competitions, including public-private partnerships and the authorization, permission, granting and concession for the exploration of public services and natural resources, for proposals that provide greater savings in energy, water and other natural resources and the reduction of greenhouse gases and waste emissions;

Source: Jodas, 2021, p. 74.



The legal definition of ecosystem services, as set out in Law No. 14,119/2021 (National PES Policy)⁷, is in line with the doctrinal understanding discussed above, as it considers them to be “benefits relevant to society generated by ecosystems in terms of maintaining, restoring or improving environmental conditions” (Article 2, II).⁸.

In addition, the aforementioned federal standard also categorized ecosystem services into provisioning services (those that provide environmental goods or products used by humans for consumption or commercialization, such as water, food, wood, fibers, etc.); supporting services (those that maintain life on Earth, such as nutrient cycling, waste decomposition, seed dispersal, etc.); regulating services (those that contribute

⁷ Federal law that established the National PES Policy and the Federal PES Program, which will be dealt with in more detail in section 2 of this work.

⁸ Art. 2 For the purposes of this Law, the following shall be considered: II - ecosystem services: relevant benefits to society generated by ecosystems in terms of maintaining, restoring or improving environmental conditions, in the following forms: a) provisioning services: those that provide environmental goods or products used by humans for consumption or commercialization, such as water, food, wood, fibers and extracts, among others; b) support services: those that maintain the sustainability of life on Earth, such as nutrient cycling, waste decomposition, production, maintenance or renewal of soil fertility, pollination, seed dispersal, control of populations of potential pests and potential vectors of human diseases, protection against ultraviolet solar radiation and maintenance of biodiversity and genetic heritage; c) regulatory services: those that contribute to maintaining the stability of ecosystem processes, such as carbon sequestration, air purification, moderation of extreme climate events, maintenance of the balance of the hydrological cycle, minimization of floods and droughts and control of critical erosion and landslide processes; d) cultural services: those that constitute non-material benefits provided by ecosystems through recreation, tourism, cultural identity, spiritual and aesthetic experiences, and intellectual development, among others;

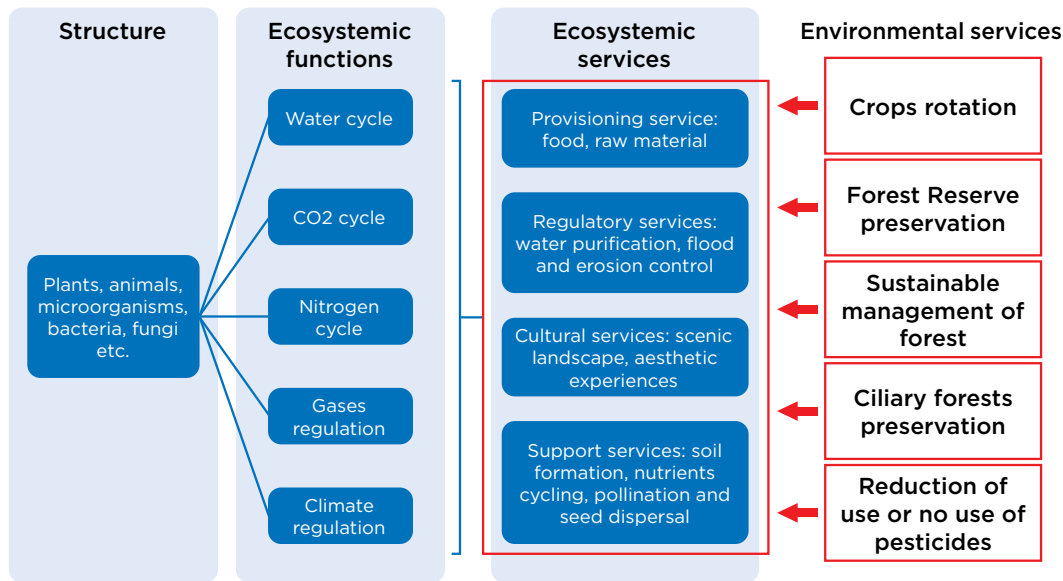
to maintaining the stability of ecosystem processes, such as carbon sequestration, air purification, moderation of extreme weather events, etc.) and cultural services (which constitute the non-material benefits provided by ecosystems through recreation, tourism, cultural identity, spiritual experiences, etc.). This classification, given by the federal regulatory framework, is aligned with that established worldwide by the Millennium Ecosystem Assessment (2005, pp. 39-40).

Once the concept of ecosystem services is understood, it is possible to more easily discern the concept and correlation with environmental services. This is because environmental services are human actions used to improve, enhance, recover or restore ecosystem services in a location.

Now, if a water basin that is important for the supply of a given region is degraded, that is, impacted by local pollution, erosion, deforestation and inadequate land use, and is no longer qualified to meet the water needs of the population, we have a situation in which it would be possible to provide incentives (by the public authorities or by interested private initiatives) for the provision of environmental services in order to improve the affected water source. In this case, the environmental services would be provided by the owners, possessors or even by the rural community living in the basin, so that these people, through financial or non-financial compensation, would, for example, i) restore the degraded ciliary forests of this watercourse; ii) fence these ciliary forests so that cattle could not trample the recently planted seedlings; iii) adopt biodigesters in their areas, so that rural sanitation would reduce water pollution; iv) rationalize the use of pesticides in their plantations, also with the purpose of improving the quality of that river, among other actions. See, actions i to iv represent environmental services that may be carried out to increase the provision of ecosystem services offered in that particular basin. Figure 2 below provides a more didactic and visual compilation of the relationships between ecosystem services and environmental services.

Figure 2. Ecosystem services and environmental services: connections

Source: Jodas, 2021, p. 139.

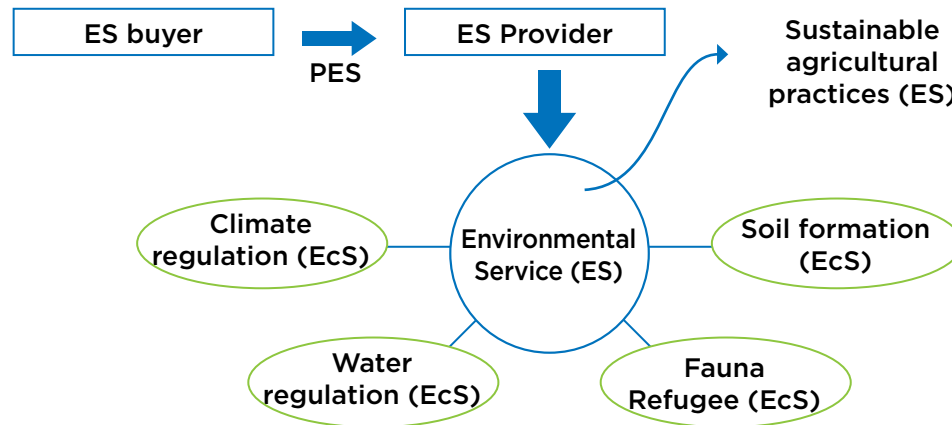


Likewise, the federal regulatory framework (Law No. 14.119/2021) defined environmental services as “individual or collective activities that favor the maintenance, recovery or improvement of ecosystem services” (art. 2, III). Thus, in turn, PES is the monetary or non-monetary payment (for example, the construction of dams, seedlings of fruit species, inputs for the construction of chicken coops (Tejeiro; Stanton; Lavratti, 2014, p. 103), the implementation of environmental sanitation, among others) aimed at promoting environmental services in a given location, with the purpose of increasing, improving or recovering the provision of ecosystem services.

By legal definition, PES is the “voluntary transaction, through which a payer of environmental services transfers financial resources or another form of remuneration to a provider of these services, under agreed conditions, respecting the relevant legal and regulatory provisions” (Law No. 14,119/2021, art. 2, IV.). Figure 3 demonstrates the implications and correspondences between PES, environmental services and ecosystem services.

Figure 3. PES x environmental services x ecosystem services

Source: Jodas, 2015, p. 100.



Both the legal definition and the widely adopted definition of PES (Wunder, 2005)⁹ denote the presence of at least one “buyer” of environmental services in these voluntary transactions. However, it has to be said that, in Brazilian practice, PES projects are much more like a public policy that involves and articulates different players and institutions than individualized commercial situations between “buyers and providers”, as the concept seems to suggest.

In this regard, the analysis made by Muradian et al. (2010, pp. 1206-1207) is very pertinent, in the sense that the services with which PES schemes deal are often environmental public goods, and their provision involves a collective action problem, because it requires the coordination of several players to avoid undesirable results from a social point of view. Therefore, they cannot be reduced to an economic tool used to guarantee environmental protection in the most efficient way possible (as suggested in their definition). In another direction, PES initiatives constitute a mechanism to reconnect land use decisions between different players through cooperation, and this process is mediated by existing institutions, which include property rights, legal frameworks, social perceptions and cultural values (Vatn, 2010 apud Muradian et al., 2010, p. 1205).

These considerations lead us to view PES, especially in Brazil, as a transfer of resources between social players, with the aim of creating incentives to align decisions on land use (individual and collective decisions) with the social interest in nature management (Muradian et al., 2010, p. 1205), with economic incentives being just one of several factors capable of influencing patterns of behavior linked to the provision of environmental

9 Most widely known definition: “a voluntary transaction, where a well-defined environmental service (or a land use that ensures that service) is purchased by (at least) one buyer from (at least) one provider, if and only if the provider of the environmental service ensures such provision (conditionality)” (Wunder, 2005, p. 3).

services. In view of this, it is important to understand how PES experiences have been developed in Brazil, from the perspective of those who have managed these types of projects and those who have participated in them as providers of environmental services.

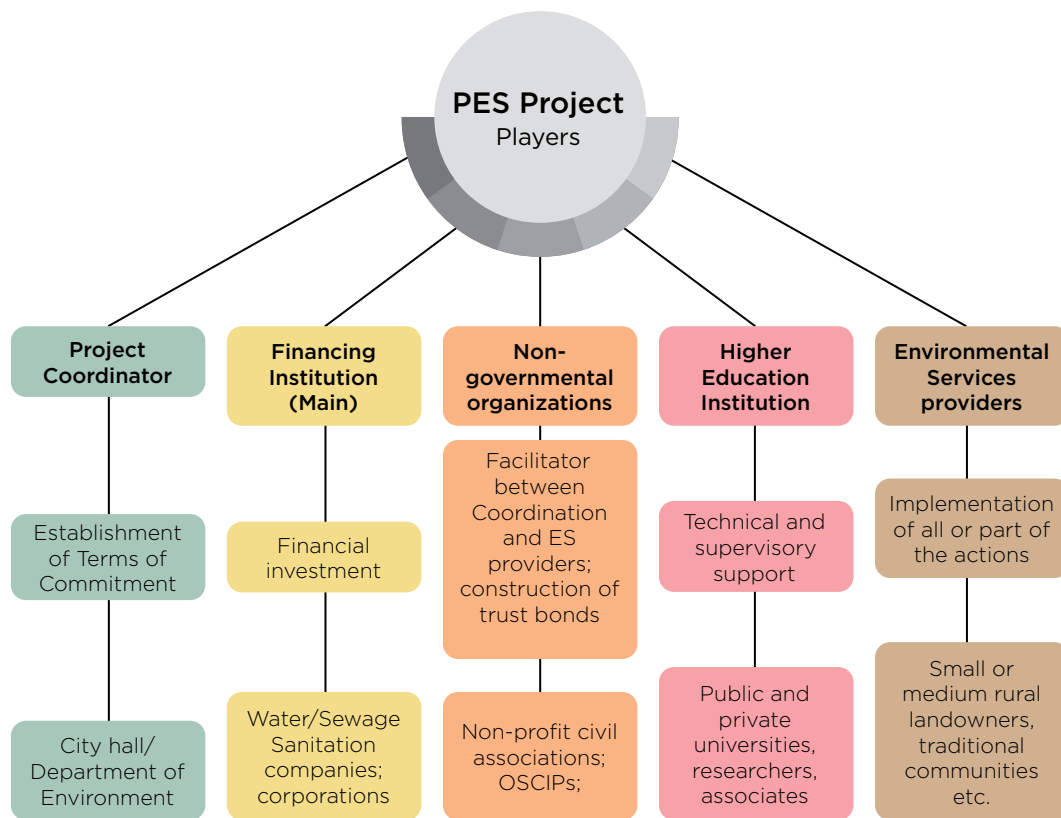
1.2 WHO MANAGES AND RECEIVES THE PES?

PES initiatives have existed in Brazil since the mid-2000s, resulting in a wide variety of models and formats. Unlike other situations marked, for example, by the publication of a federal law creating PES and setting guidelines for their propagation, here there was a “bottom-up” movement, in which multiple and diverse local and regional players were responsible for building these systems. It is not uncommon for projects led by city or state governments to create their own laws to regulate these experiences. However, this path has not necessarily been followed in the same way by similar experiences, while PES schemes led by the private sector or even by organized civil society have also often lacked legal standards.

The structure of PESs can vary greatly, given that partnerships are very common in these arrangements, with the definition of very specific and complementary roles, as shown in Figure 4. On the one hand, project coordination or management can be carried out by an institution, such as the municipal government, and on the other hand, environmental service (ES) providers vary between small or medium rural landowners or possessors, traditional communities, rural settlements, among others.

Figure 4. Players PES project

Source: Jodas, 2025.



In the “middle”, between the ends, there are other collaborating entities, such as the financier (who may be different from the project coordinator); an NGO, whose role, in general, is linked to facilitating contact between local governments and providers, establishing a relationship of trust. Furthermore, NGOs are equipped with technical knowledge and expertise to, for example, assist in monitoring, recommend and apply environmental valuation methodologies and results monitoring, among others. At the same time, there is also room for contributions from educational and research institutions, i.e., universities and institutes that can develop indicators to measure results, investigate the effectiveness of actions, propose effective measures to increase and improve the provision of ecosystem services, among others.

It is worth mentioning that municipal governments, state governments (through state environmental departments), private initiatives (corporations) and non-governmental organizations (NGOs) have acted as coordinators or managers of PES projects. While the providers of environmental services, that is, those who will receive monetary or non-monetary

incentives, have been rural landowners or possessors, traditional communities and peoples and, in some cases, urban waste pickers¹⁰.

2 REGULATORY FRAMEWORKS FOR THE PES IN BRAZIL

As mentioned in the previous section, the movement to create PES programs and projects occurred in a rather diffuse and peculiar manner in various regions of Brazil, without a federal regulatory framework to provide order and rules for the development of the instrument in question. Therefore, when Law No. 14.119/2021¹¹ was published¹², after more than ten years of debate in the National Congress, there had already been PES initiatives underway in Brazil for decades, which is why this federal law outlined general lines and guidelines, combined with the establishment of definitions, objectives and actions.

Although lacking regulation, Law No. 14.119/2021 established a disciplinary policy for the numerous PES projects that exist or will be created in Brazil, listing important and necessary definitions, as well as guidelines, objectives, and actions. At the same time, it created the Federal Payment Program for Environmental Services (PFPSA), that is, a specific program to be conducted by the Union, with the objective of promoting actions to maintain, recover or improve vegetation cover in priority areas for conservation, combat habitat fragmentation, create biodiversity corridors and conserve water resources (art. 6).

In addition, the federal law established the National PES Registry (NPESR), with the aim of consolidating, in a single database, information submitted by the relevant federal, state, and municipal entities, private agents, and other organizations involved in PES projects (Article 16). This NPESR should integrate other federal platforms linked to access to information, such as the National Environmental Information System (SINIMA)¹³, the Brazilian Biodiversity Information System (SiBBr)¹⁴ and

10 For further information, please refer to the Bolsa Reciclagem Program in Minas Gerais, established by Law No. 19.823/2011 and regulated by Decree No. 45.975/2012.

11 Established the National Policy on Payment for Environmental Services (PNPSA).

12 Until the publication of the National Policy on Payment for Environmental Services (Law No. 14.119/2021), the PES had as its federal normative reference article 41 of Law No. 12.651/2012 — which provides for the protection of native vegetation, popularly known as the “new Forest Code”.

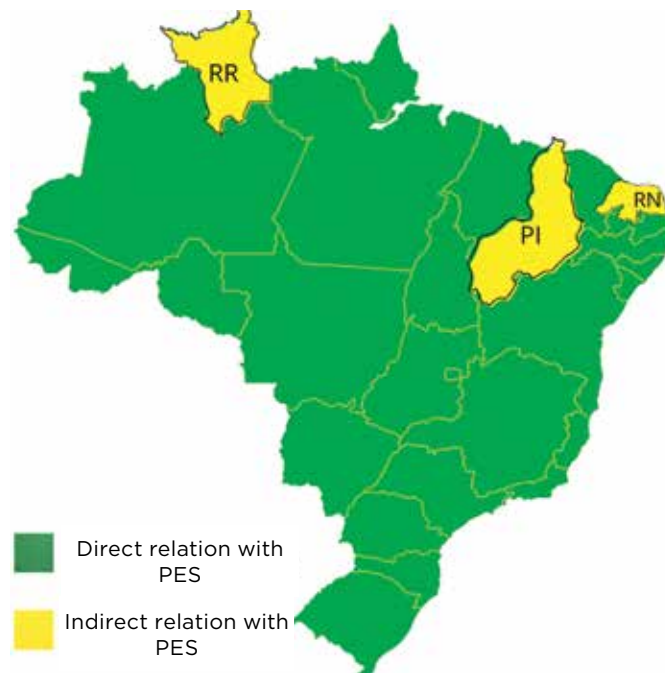
13 SINIMA does not yet exist; according to information from the Ministry of the Environment and Climate Change, efforts are underway to implement it. See <https://antigo.mma.gov.br/component/k2/item/11232-sistema-nacional-de-informa%C3%A7%C3%B5es-sobre-meio-ambiente-sinima.html>.

14 See <https://www.sibbr.gov.br/>

the Rural Environmental Registry System (Sicar)¹⁵. However, in the absence of legal regulations, the NPESR still lacks greater substance on the national scene.

Regarding PES regulation at the state level, based on studies previously carried out by the author¹⁶, Figure 5 shows that in 2025, 24 (88.8%) states have state legislation specifically referring to PES, i.e. a law creating a state PES policy and/or a PES project or program in this area (laws directly related to PES); while 3 (11.2%) states have state policies that mention PES as one of their instruments (laws that are indirectly related to PES), such as Roraima, in the North region; and Piauí and Rio Grande do Norte, in the Northeast. It can be seen that all Brazilian states have some kind of regulatory act alluding to PES.

Figure 5. Brazilian states with PES laws



Source: Jodas, 2025.

¹⁵ See <https://www.car.gov.br/#/>

¹⁶ The author updated the database regarding state legislation in 2022. The new search was carried out by searching for the word “pagamento por serviços ambientais” [payment for environmental services] on legislative pages of each of the Brazilian states in the federation.

The analysis of 2025 also showed that, after the publication of Law 14.119/2021, states that did not have any rules on PES now have them, such as Tocantins. At the same time, states that had only used PES as an instrument of other environmental policies (e.g. climate, agroecology, combating illegal deforestation, among others) decided to create their own rules on PES in their territories, as happened in Pará, Amapá, Alagoas, Ceará, Sergipe, Mato Grosso and Rio Grande do Sul. It was also possible to note that even states that already had a state PES or environmental services policy before 2021, with the publication of the federal standard, received additions to their legislative framework to include PES in other regulatory frameworks or even to update existing ones, as was the case in Amazonas, Acre, Rondônia, Bahia, Maranhão, Pernambuco, the Federal District, Goiás, Mato Grosso do Sul, Espírito Santo, Rio de Janeiro, São Paulo, Minas Gerais, Paraná and Santa Catarina.

It can be inferred that the aforementioned federal regulatory framework spurred a legislative movement on PES at the state level. Even states that already had state PES policies or some PES program or project in this sphere ended up undergoing some legislative change to update or even create new mechanisms in line with Law No. 14.119/2021. This phenomenon indicates that there is considerable expectation on the part of the states regarding the necessary federal regulation of the various mechanisms introduced by this rule, especially in terms of the possibility of partnerships and funding for these initiatives.

3 WHAT ARE THE LINKS BETWEEN PES AND CLIMATE CHANGE?

Land use change is a complex process of altering the Earth's surface through human activities. It consists of converting a piece of land from one purpose to another, for example, when wild lands (occupied by tropical forests) are replaced by palm oil plantations (Lee-Gammage, 2018, p. 6). In Brazil, the sector that contributes most to greenhouse gas (GHG) emissions, and consequently to climate change, is land use change.

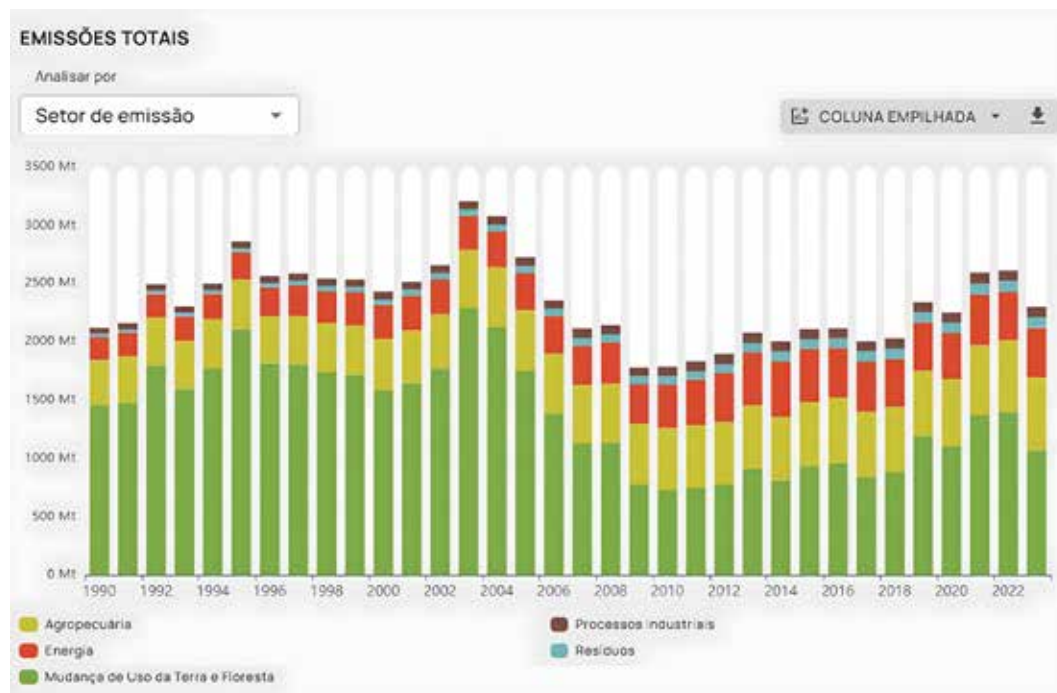
In Brazil, land use change is marked by alterations in land use and land cover, the burning of forest residues and soil liming¹⁷. Deforestation is the largest contributor to Brazil's gross emissions in the land use change sector and, in 2023, accounted for 98% of the sector, of which 65% came from deforestation in the Amazon (678 tons), followed by the Cerrado,

17 The purpose of liming is to correct the acidity of the soil, raising the pH and neutralizing the toxic effects of aluminum and manganese, thus helping crops to make better use of nutrients. In addition to correcting acidity, liming raises the calcium and magnesium levels in the soil, because limestone, which is the commonly used corrective, contains high levels of these nutrients. (Silva, 2021).

with 19% (202 million tons), the Atlantic Forest, with 7% (74 million tons), Caatinga with 6% (60 million tons), Pantanal with 2% (16 million tons), and Pampa with 1% (10 million) (TSAI, *et al.*, 2024, p. 29).

As can be seen in Graph 1, for decades (since 1990) land use change has been the activity that generates the most GHG emissions in Brazil. This is followed by agriculture¹⁸, energy¹⁹, waste²⁰ and industrial processes²¹, respectively.

Graph 1. Total Brazilian GHG emissions (1990 to 2022)



Source: SEEG, 2025.

Looking at the sectors that most contribute to climate change in Brazil, namely land use change and agriculture, it is possible to say that forest restoration and conservation projects and programs such as PES can help in the challenging task of reducing the levels of forest deforestation in the biomes and promoting actions capable of maintaining, recovering and improving the environmental conditions of ecosystems impacted by agriculture.

- 18 Emissions from enteric fermentation (commonly known as “cattle burps”); treatment and disposal of livestock manure; irrigated rice cultivation; burning of agricultural residues from sugarcane and cotton, among others) (Tsai, *et al.*, 2024, p. 13).
- 19 Emissions from the combustion of fuels from transport, industry and electricity generation (Tsai, *et al.*, 2024, p. 20).
- 20 Emissions mainly from the disposal of solid waste in controlled landfills, dumps and sanitary landfills, domestic wastewater treatment and industrial wastewater treatment) (Tsai, *et al.*, 2024, p. 25).
- 21 Emissions produced by physical and chemical transformations occurring during the manufacture of materials such as steel and cement, as well as by the use of refrigeration equipment. (Tsai, *et al.*, 2024, p. 20).

In this sense, regarding land use change, PES can be associated with the goal of promoting increased vegetation regeneration, carbon sequestration, reducing erosion processes, creating refuges for fauna and increasing CO₂ stocks (SEEG, 2021, p. 138). Thus, PES arrangements focused on stimulating the formation of ecological and agroforestry corridors to connect forest fragments between municipalities (SEEG, 2021, p. 138) can constitute alternatives with the potential to tackle climate change, given the trend in recent years of an increase in deforested areas²². The PES typology frequently adopted in areas threatened by deforestation is REDD+ (Reducing Emissions from Deforestation and Forest Degradation), an incentive model developed and parameterized directly by the United Nations Framework Convention on Climate Change (UNFCCC), of which Brazil is a signatory²³.

Concerning the agricultural sector, PES schemes that provide for the remuneration of rural landowners to conserve remnant vegetation in urban and peri-urban areas, restore and replenish vegetation in areas degraded by agroforestry systems, sustainable management of agricultural systems, and maintaining areas of native vegetation that would be eligible for authorization for alternative land use (SEEG, 2021, p. 16) would be fruitful pathways to reduce and offset GHG emissions generated by the sector in question.

In this regard, the Water Conservation Project in Extrema, one of the first to be created in Brazil at the municipal level, is a positive example of how a PES arrangement can remain in place over time and combine mechanisms to combat climate change, as will be explained in more detail below.

3.1 “Water Conservator” from Extrema/MG: from forest preservation to combating climate change

The “Conservador das Águas” (Water Conservator) program, managed by the Municipality of Extrema/MG²⁴, is perhaps the most memorable PES project on the subject, as it was one of the first municipal laws to

22 Although from 2022 to 2023 there was a drop in deforestation for the first time in the last 3 years (SEEG, 2024, p.7).

23 For more information, see <<https://www.gov.br/mma/pt-br/composicao/secd/redd>>.

24 Extrema is located in the upper part of the Piracicaba, Capivari and Jundiá river basins (PCJ basins), located in a region of springs and indirectly responsible for supplying 9 million people in the Metropolitan Region of SP and 3 million people in the metropolitan region of Campinas, which is equivalent to 12 million people (EXTREMA, 2017, p.12).

regulate the instrument in its territory²⁵ and, at the same time, an initiative that has been in existence for almost twenty years, which has made it possible to gather more data and results on its performance over time. When the first terms of commitment were formalized in 2006, the project aimed to maintain the quality of the water sources in Extrema (Jaguari River basin) and promote the environmental suitability of rural properties. The main environmental services related to these goals focused on promoting, among the program participants (small and medium-sized rural landowners and livestock farmers in the region), soil conservation (construction of containment basins and terraces), adequate treatment of effluents (installation of biodigesters) and solid waste (selective collection implemented in rural areas) and the recovery of legally protected areas, such as Permanent Preservation Areas (PPAs), especially springs, ciliary forests and hilltops, and Legal Reserves (LRs).

In addition to Extrema City Government, the project has more than a dozen partner institutions, namely: State Forestry Institute (IEF-MG), National Water Agency (ANA), The Nature Conservancy (TNC), SOS Mata Atlântica, Piracicaba, Capivari, and Jundiaí River Basin Committee (PCJ); Agricultural Research Support Foundation (FundAg) and several companies in the region (Extrema, 2014). In 2017, after twelve years of project execution, the Extrema City Government accounted for 1,554,793 native seedlings planted; 6,378 hectares protected; 238 PES contracts (Terms of Commitment) signed; 276,811 meters of fences built (for the protection of PPAs); 1,000 rainwater containment basins implemented; 40 thousand meters of terraces in 100 hectares; 50 biodigesters installed, among other numbers (Extrema, 2017, pp. 18-22). Table 1 shows the expansion of the program between 2007 and 2017 in terms of area, number of contracts and payments made.

²⁵ Municipal law No. 2.100/2005

Table 1. Evolution of the area and amounts of PES paid by the program

Year	Number of contracts	Area (hectares)	PES amount paid in the year (BRL)
2007	21	451	16.165,00
2008	14	306	106.858,00
2009	26	674	226.101,00
2010	15	894	340.529,00
2011	24	523	419.462,00
2012	44	2.356	557.106,00
2013	17	415	631.881,00
2014	12	177	707.512,18
2015	13	262	769.154,26
2016	38	243	690.184,36
2017	14	145	734.770,98
Total	238	6523	5.199.724,78

Source: Extrema, 2017.

Image 1. Froes family property, 2007.



Source: Extrema, 2017.

Image 2. Froes family property, 2007



Source: Extrema, 2017.

In 2017, the municipality published its *Greenhouse Gas Emissions Inventory* and, at the same time, began work on the creation and discussion of a Municipal Climate Change Policy, which was published the following

year (Law No. 3,829/2018²⁶) (Extrema, 2017, p. 97). Since then, the *Extrema no Clima* (Extrema in the Climate) program has been launched, an additional modality whose purpose is to bring the commercial and industrial sectors closer to forest restoration and carbon sequestration initiatives. To this end, the municipality has set up a system for neutralizing GHG emissions as part of the environmental licensing process, in which companies submit reports on their consumption of water resources and sources of GHG emissions to the Extrema Municipal Department of Environment (SMA) so that an emissions inventory can be issued and, in return, economic agents receive emissions compensation certificates, which are neutralized within the Water Conservation project itself (Extrema no Clima, 2020).

In addition, the Extrema PES continues to expand its activities, as the municipality has been hoping for some time, specifically in an attempt to form ecological corridors in the region and connect conservation units (Jodas, 2015, p. 186). Along these lines, the Mantiqueira Conservation Plan (PCM) was created in 2016, which consists of a collective initiative that brings together agents from the public sphere, third sector, educational institutions and private sector, aimed at promoting the forest restoration of 1.5 million hectares in more than 425 municipalities covered by the Serra da Mantiqueira in the states of Minas Gerais, São Paulo and Rio de Janeiro. PCM is an initiative of the municipality of Extrema, the International Union for Conservation of Nature (IUCN), TNC Brasil, SOS Mata Atlântica, WRI Brasil, ANA and FUNDAG. The Mantiqueira Conservation Plan continues to expand across several municipalities in the Atlantic Forest, adopting PES as one of the strategies for conserving ecosystems, promoting water security, combined with the neutralization of GHG emissions in the regions covered by the program.

FINAL CONSIDERATIONS

Economic instruments are a type of legal tool widely used in Brazilian environmental policies, which are used by federal entities to enforce the objectives pursued by their sectoral policies, as a complement to command and control mechanisms. PES, environmental taxation, among others, illustrate these economic typologies arising from legal norms that give a functional nature to Law.

Based on the necessary distinction between ecosystem services and environmental services, PES can simply be understood as a monetary or non-monetary incentive for human practices aimed at protecting nature.

26 Establishes the Policy to Combat Climate Change in the Municipality of Extrema, State of Minas Gerais.

In other words, PES aims to induce certain communities or social groups to adopt favorable behaviors (here understood as environmental services themselves, such as planting native species in permanent preservation areas of springs, riverbanks, hilltops, for example) with a view to increasing or improving the provision of ecosystem services in a region (improving water quality, preserving hillsides, reducing water siltation, etc.).

Law 14.119/2021 inaugurated the federal legal treatment of PES, but long before that PES projects and programs were scattered and built in different ways in all regions of Brazil. State and municipal legislation have also been present over the last few decades, and it is certain that, after 2021, there was an increase in the number of regulatory acts published by Brazilian states with the aim of establishing state PES or environmental services policies, or even creating specific programs of this kind.

It is also possible to note that PES has been an instrument listed alongside state climate change policies, given that Brazil's land use change sector is the most responsible for generating GHG, which makes forest conservation and recovery projects and programs particularly important for climate mitigation and adaptation. For this reason, the Water Conservator program, which has been developed in Extrema/MG for more than twenty years, is currently focusing its efforts on neutralizing the GHG emitted by companies and industries in the region, as part of the municipal licensing processes which, in turn, are supported by Extrema's municipal climate change policy, published in 2018.

Finally, it is important to point out that PES, like other tools that are part of sectoral policies aimed at protecting the environment, is not without its critics in terms of how certain experiences have been implemented and also the lack of data related to monitoring and results regarding its effectiveness. These and other aspects are fundamental and need to be constantly discussed by society, including welcoming the point of view of the social players involved in each of these initiatives.

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CIRCULAR ECONOMY IN BRAZILIAN VALUE CHAINS: PROGRESS AND CHALLENGES

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ABSTRACT

The article addresses the circular economy as a way out of the environmental and humanitarian crisis caused by centuries of linear economy that compromises the planet's sustainability. Developing the concept and addressing the principles of this new paradigm, the article contextualizes the progress of the agenda at the international and national levels. Next, it presents the experience of a project aimed at supporting the transition to a circular economy based on sustainability practices of micro, small, and medium-sized enterprises inserted in the value chains of large international companies operating in Brazil. Based on the challenges these companies face in joining the agenda, and aiming to combine theory and practice in solving the obstacles, the article points to possible paths for consolidating the circular economy as a new economic development paradigm, indicating that the transition starts with a change in mindset around the meaning of resources.

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THE LINEAR LOGIC OF PRODUCTION AND CONSUMPTION AND THE URGENCY OF TRANSFORMATION

One way to understand the “circular economy” is to contrast it with the “linear economy”, which is the current prevailing system, whose logic is based on extracting resources from nature to transform them into products that are used and then discarded. Unsustainable over time, linear thinking is anchored in an unrealistic logic of infinite resources — which presupposes exceeding planetary limits — consumerism and social inequality.

By way of illustration, humanity’s demand for natural resources exceeded the capacity of the planet to regenerate its ecosystems on August 1st, 2024 (Wackernagel, 2024, p. 1). In other words, the resources exploited from this date until the end of the same year are used excessively, resulting in an ecological deficit. The symbolic date, calculated each year by the international research organization Global Footprint Network, draws attention to the excesses of contemporary society and illustrates the environmental impact on the world of the current rate of consumption among people. In practice, this configuration points to essential problems, such as air, water and soil contamination and food shortages, for example. Another problem associated with excessive consumption of natural resources is the predatory exploitation of non-renewable resources, such as oil, causing environmental and social impacts on a global scale, such as the climate crisis.

If the situation is already delicate at present, the scenario could worsen even further if risks such as extreme weather events, biodiversity loss and ecosystem collapse, critical changes in terrestrial systems and natural resource scarcity are taken into account. These scenarios make up the ranking of the four most severe global risks over a horizon of just 10 years, according to the 20th edition of the *Global Risk Report*, a reference document from the World Economic Forum (WEF, 2025, p. 9). Another critical factor is the increase in the world population, which, according to some projections, will reach 10 billion people by mid-2080 (Undesa, 2024, p. 34), putting even more pressure on the ecological deficit mentioned above.

Bringing these issues to the Brazilian context, one of the major — and long-standing — challenges in the country is waste management. It is estimated that more than 40% of municipal solid waste is disposed of inappropriately, according to the *Panorama of Solid Waste in Brazil for 2023* (Abrema, 2024, p. 35). As a result, both the air and surface and groundwater are contaminated, posing a risk to public health and ecosystems.

The same survey pointed to a recycling rate of only 8% of urban waste, with more than two-thirds of the volume being attributed to waste pickers (ibid., p. 32). Although these important players in recycling provide an essential service to the country in terms of volume and coverage, it is still an informal market. This leads to statistical weaknesses and economic marginalization of waste pickers, who often perform their work in precarious conditions (Pimp My Carroça; Cataki, 2022, pp. 37, 80). This data highlights the size of the problem with just one facet of the linear model and, at the same time, its enormous potential for improvement.

It is clear that the linear economic model cannot sustain the current reality or that which will emerge in the near future. This makes it urgent to transition to an economic system that respects the planet's limits and promotes regeneration.

CIRCULAR ECONOMY AS A PARADIGM

In this scenario, the question arises: what routes can be taken to mitigate these planetary crises and take care of our (finite) natural resources? The answer is certainly multifaceted and involves a set of actions, including the circular economy, which proposes revising the way products are designed, produced and consumed, rethinking the origin of raw materials, volumes produced, product quality, and process effectiveness and efficiency.

Unlike the “linear economy”, which assumes an “extract-produce-use-dispose” logic, a circular economy model involves reducing pressure on (finite) natural resources by relying on circular flows, seeking to maximize the use of resources already extracted from nature (FGVces, 2024, p. 12). The model has already been conceptualized by various lines of thought (Farias et al., 2021, p. 290), such as industrial ecology, eco-efficiency, industrial ecosystems, industrial symbiosis, performance economy, cradle to cradle, blue economy, natural capitalism, among others (Modifica, FGVces, Regenerate, 2020, p. 33). Although diverse in their origins, foundations and approaches, these lines propose circular economy concepts that converge on the following common principles: extending the useful life of materials and products over several cycles of use; recovering materials and ensuring that biological materials that return to the earth are benign; retaining process inputs for as long as possible; adopting systemic thinking methods in the design of solutions; regenerating or minimally preserving nature and living systems; and promoting public policies to accelerate change.

In addition to these principles, the circular economy must also be understood through the various “Rs” that comprise it. The circular economy is often associated with recycling, which involves transforming used or discarded materials into new products. However, the circular model goes far beyond so-called “end-of-pipe” strategies, which only consider waste after it has been generated. The circular economy encompasses other important “Rs”, such as rethink, refuse, reduce and reuse (Meshram, 2024, p. 12).

Finally, in addition to the common principles and “Rs”, there is a third element that is fundamental to understanding the circular economy: regionalization. When discussing the circular economy in Latin America, it is important to consider the particularities of the region, such as the fact that it is a major producer of commodities on the one hand, and a locus of many negative externalities generated by extractivism on the other, as well as the realities of those at the “front line” of the production chains, for example, waste pickers in Brazil who, although fundamental to “keeping the wheel turning” (or circulating), face significant challenges, such as stigma and lack of appreciation (Pimp My Carroça; Cataki, 2022, p. 29). Thus, for the discussion proposed here, we will adopt a view of the circular economy that starts from the definition highlighted above and is complemented by the common principles, the “Rs”, and the regional aspects discussed.

So the next question is: how is the circular economy doing today? Globally, there are important initiatives underway to move towards a more circular economy. At the international level, for example, the recently created ISO 59000 series of standards stands out, which establishes definitions, practices and tools to promote circularity (ISO, 2024); and the Circular Economy Action Plan for the European Union, created in 2015 under the European Green Deal and updated in 2020, creating a commitment to double the rate of use of circular materials by 2030 (European Commission, 2020, p. 2). Regionally, it is worth mentioning the Coalition for the Circular Economy in Latin America and the Caribbean, of which Brazil is a member. This is a multi-player initiative launched in 2021 to develop a regionalized vision and strategy for the circular transition (Coalición de Economía Circular para América Latina y El Caribe, 2025).

In Brazil, despite the challenges that still exist—some of which are discussed below—significant progress has been made on the agenda, as indicated by the policies and laws enacted by the federal government in recent years. In 2024, the government launched the National Circular Economy Strategy (ENEC), which establishes general guidelines for the transition, such as zero waste generation, increased life cycles, maintenance of material value, and environmental regeneration (Brazil, 2024). ENEC also proposes the creation of a regulatory and institutional framework,

including targets, indicators and financial instruments, to promote circularity. Also in 2024, the National Circular Economy Forum was created, a multisectoral entity composed of representatives from the government, the private sector and civil society aimed at supporting and monitoring its implementation. The creation of a group with different players to share common challenges and act collaboratively to promote ENEC is essential for advancing the agenda in the country and is in line with the systemic approach that characterizes the circular economy.

In addition to ENEC, other noteworthy advances include the regulation, in 2024, of Law No. 14.260/21 to encourage the recycling industry, popularly known as the “Rouanet Recycling Law” (Brazil, 2021), and the less recent but fundamental National Solid Waste Policy (PNRS). PNRS brought innovations to solid waste management in Brazil, such as the concept of reverse logistics, which establishes the responsibility of the generator for the waste produced (Brazil, 2010). Reverse logistics seeks to promote the collection and return of solid waste to the business sector for reuse in its own cycle or in other production cycles, or for other environmentally appropriate final disposal.

Finally, it is important to mention some initiatives that, although still under consideration, may bring progress to the country. Currently, there is a discussion in the Chamber of Deputies regarding the creation of a National Circular Economy Policy (PNEC) — Bill No. 1.874/2022 (Brazil, 2022a). PNEC seeks to encourage the conscious use of resources, promote discussion on traceability, raise awareness in society regarding the use of resources, strengthen value chains through the recovery and reuse of resources, among other objectives. In addition, there is also a discussion underway on the so-called “Plastic-Free Ocean Bill” — Bill No. 2.524, which seeks to create rules related to plastic circularity, such as banning single-use plastics and paying waste pickers for the environmental services they provide (Brazil, 2022b).

Thus, the international and national scenarios are favorable to the circularity agenda, which is gaining prominence and visibility. Brazil, in particular, has made significant progress, which explains why it was chosen to host the 9th edition of the World Circular Economy Forum, held in São Paulo in May 2025. This occasion provided an opportunity for the exchange of information, experiences and best practices among various players — from Brazil and abroad — to advance this fundamental agenda.

CHALLENGES AND OPPORTUNITIES AHEAD: LESSONS LEARNED FROM A PROJECT IN THE ENERGY AND TELECOMMUNICATIONS VALUE CHAINS

It is within this context that the project *Ancorando Cadeias de Valor Sustentáveis no Brasil* (Anchoring Sustainable Value Chains in Brazil) was launched, an initiative led by the Center for Sustainability Studies at the Getulio Vargas Foundation (FGVces), in partnership with the Spanish Chamber of Commerce and the Official Spanish Chamber of Commerce in Brazil, supported by the European Union's AL-INVEST Verde program, which seeks to boost the green transition of small businesses towards a circular and low-carbon economy in Latin America and the Caribbean. The project aimed to support this transition by strengthening sustainability practices in micro, small and medium-sized enterprises (MSMEs) that are part of the value chains of large international companies (anchor companies) operating in Brazil.

The initiative had several fronts, ranging from training a group of MSMEs that supply the anchor companies Iberdrola Neoenergia and Telefônica Vivo on sustainability management and circular economy matters, to creating a community of practice made up of various players in the ecosystem to exchange knowledge, experiences and form partnerships.

One of the first activities carried out in the project was an assessment aimed at understanding how sustainability and circularity in production processes have been incorporated into the strategies and practices of participating companies. The methodology for this consisted of two online questionnaires throughout the project: the first was implemented at the start of the initiative, between July and August 2023 (Questionnaire 1); and the second was applied at the end of the project, between November 2024 and February 2025 (Questionnaire 2). It should be noted that the two instruments had different scopes and methodological designs, adjusted according to the objectives of each stage.

Questionnaire 1 (2023) was drawn up based on consolidated methodologies, such as the *Corporate Sustainability Index - ISE* (Iseb3, 2023, p. 6) and the *Quantitative Assessment - Ranking 2022/2023* (Exame, 2023). Its objective was to assess the degree of maturity of MSMEs on various sustainability fronts — including the circular economy — in order to support the implementation or improvement of management practices aligned with the principles of sustainable development. This instrument comprised 539 questions, organized into 62 thematic indicators and distributed across five dimensions: General, Economic, Environmental, Social and Value Chain. Questionnaire 2 (2025), in turn, focused on analyzing the changes that occurred over the 18 months of the project in the participating MSMEs, considering the main aspects related to sustainability and

the circular economy that were addressed during the initiative through training activities and exchanges of experience. This second questionnaire was more concise, containing 64 questions distributed across the same five dimensions mentioned above.

Within the scope of this article, the analyses presented correspond to a partial evaluation of the data collected through these tools, considering the two moments of application to the MPMEs participating in the project. In total, 28 MSMEs participated in the assessments in 2023, of which 3.6% were micro-enterprises, 21.4% were small enterprises, and 75% were medium-sized enterprises; and 29 MSMEs participated in 2025, of which 3.4% were micro-enterprises, 17.2% were small enterprises, and 79.3% were medium-sized enterprises. Thus, the sample universe is the same in both surveys, which is why they are comparable.

The questionnaire administered in 2023, at the beginning of the project, revealed that although 60% of the responding companies were familiar with the concept of circular economy, only 28% had adopted actions or programs aimed at putting it into practice. This analysis was extracted from two aspects of the diagnosis specifically focused on the circular economy: the first based on a self-assessment question asked to companies about their degree of maturity in this agenda; and the second based on the results of Indicator 28, which examined practices directly related to the circular economy.

Understanding that the circular economy agenda is broad and cross-cutting and that sustainability requires a systemic view, as indicated in the opening section of this article, we selected twenty indicators that correlate with circularity throughout the questionnaire, across the five dimensions into which it is structured (Table 1). For example, if the commitment to sustainability is formally expressed by the company and if it reports its social and environmental impacts, beyond environmental issues directly related to the circular economy, such as the use of natural resources and waste management.

Table 1. Indicators that cut across the circular economy agenda.

DIMENSION	INDICATORS
General Dimension	Indicator 1 – Fundamental Commitments
	Indicator 7 – Sustainability Report
Economic Dimension	Indicator 12 – Products and Services
	Indicator 13 – Innovation in Products and Markets
Environmental Dimension	Indicator 16 – Adoption of Environmental Mitigation and Compensation Measures
	Indicator 17 – Environmental Responsibility
	Indicator 18 – Product/Service Life Cycle Analysis
	Indicator 20 – Water
	Indicator 21 – Biodiversity and Ecosystem Services
	Indicator 22 – Effluents
	Indicator 23 – Energy
	Indicator 24 – Air Pollution and Emissions
	Indicator 25 – Climate Change and Greenhouse Gas Management
	Indicator 26 – Materials
Social Dimension	Indicator 27 – Solid and Post-Consumer Waste
	Indicator 28 – Circular Economy
Value Chain Dimension	Indicator 45 – Local Development
	Indicator 55 – Traceability and Origin of Raw Materials
	Indicator 60 – Knowledge and Management of Potential Impacts of Products and Services
	Indicator 61 – Post-Consumer Products and Services

Source: own elaboration.

The results show that of the twenty indicators that cut across the circular economy, eleven had an average performance of less than 20%. Among these, five indicators with performance below 20% in at least two of the three sizes evaluated were: Indicator 7 – Sustainability Report: 0% micro-enterprises, 4.76% small enterprises and 10.88% medium-sized enterprises; Indicator 22 – Effluents: 0% micro-enterprises, 13.89% small enterprises and 23.81% medium-sized enterprises; Indicator 21 – Biodiversity and Ecosystem Services: 14.10% small companies and 13.92% medium-sized companies; Indicator 25 – Climate Change and Greenhouse Gas Management: 1.39% small companies and 17.06% medium-sized companies; Indicator 28 – Circular Economy: 8.97% small companies and 14.65% medium-sized companies. As can be seen, with the exception of the results for micro-enterprises, the figures also point to a correlation between size and degree of maturity of practices. In other words, the larger the company, the higher its performance in the indicators analyzed. It is important to highlight that the only respondent micro-enterprise already

stood out for its sustainability practices at the start of the project, having joined the initiative as a benchmark for both anchor companies and their supplier partners.

The data collected through Questionnaire 2, at the end of the project, point to an evolution in the understanding and incorporation of practices linked to the circular economy, as indicated in Table 2 below. The results of this questionnaire show that 97% of companies reported improvements in environmental management, incorporating practices such as reducing greenhouse gas emissions through reforestation projects or reducing environmental impacts throughout the value chain in partnership with suppliers and customers through the reuse of inputs and packaging; 93% reported improvements in social aspects, such as managing risks related to human rights in the company's activities and throughout the value chain; and 90% reported improvements in corporate governance practices, such as publishing sustainability reports.

Table 2. Performance of respondent companies regarding understanding and practices adopted in relation to the circular economy.

	Is the Circular Economy a familiar concept?		Does the company adopt measures aimed at transition?	
	2023	2025	2023	2025
Microenterprises	100%	100%	100%	100%
Small enterprises	67%	100%	17%	60%
Medium enterprises	57%	96%	29%	78%

Source: own elaboration.

Overall, these results suggest that companies evolved throughout the project, both in terms of understanding the concept and in terms of implementing circular practices in their business and/or supply chain. This evolution in sustainability practices evidenced by the research conducted is largely attributed to the training process offered by the project, which emphasized corporate sustainability issues such as circular economy and life cycle thinking, greenhouse gas emissions management, human rights in value chains and materiality, and reporting practices. Even so, there is still a long way to go to strengthen the circular agenda in companies, as progress in this transition requires chain or systemic solutions. This explains why the main challenges reported during the training sessions and discussions went beyond the walls of the companies. This is the case for aspects related to innovation (products, technologies, processes and management), corporate governance, the national and international regulatory environment, and public and private financing. In other words, factors related to the ecosystem in which companies and their respective chains operate.

Given the weaknesses of companies in the energy and telecommunications sectors in adopting the circular economy, as pointed out above, the project took an in-depth look at these challenges. By addressing them on a shared know-how platform, it identified possible ways to overcome these obstacles, based not only on the academic expertise of specialists, but above all on the explanation of real and concrete experiences of MSMEs that, faced with similar problems, found solutions that, due to their innovation and relevance, should be disseminated.

Thus, aligning theory with practice, training processes and community of practice meetings were promoted with organizations participating in the project, with the aim of sharing challenges and solutions, generating replicable lessons for other business contexts. After mapping inspiring cases, four were selected to illustrate successful experiences in community meetings. The lessons learned from these meetings guided the discussions around four key areas: innovation, governance, regulatory environment, and financing.

Firstly, *technological innovation*, although essential, is not sufficient for the circular transition, since it alone does not guarantee structural changes. In view of this, the life cycle of products needs to be thought of in a systemic way, considering use, post-use and end of useful life. As an example, contemporary issues surrounding solar panels were highlighted. Although sustainable in terms of energy generation, they tend to become environmental liabilities if they are not designed for dismantling and reuse. Therefore, it is necessary to develop solutions that integrate performance and circularity from design to disposal, articulating social, economic and environmental aspects. The circular economy requires a new way of looking at materials: not just as inputs, but as circular resources. Therefore, reverse logistics, reuse and industrial symbiosis should be promoted as practices integrated into innovative business models, rather than just one-off initiatives.

In continuity, it is clear that innovation can only be sustained with a model of *circular governance*. This requires integration between different players — the public and private sectors, academia and civil society — in a collaborative network based on trust, redistribution of responsibilities and complementary roles. In this context, the public sector has the role of formulating public policies and guidelines that encourage circularity and self-regulation. The private sector, in turn, is responsible for developing markets, integrating chains and creating more sustainable commercial relationships. Educational and research institutions promote technical knowledge and applicable solutions, while civil society acts to bring about cultural transformation and change consumption patterns. This multisectoral governance allows innovative solutions to scale up and become structural.

However, innovation and circular governance need to be accompanied by a favorable *regulatory environment*. Even with the important developments mentioned at the beginning of this article, which touch on more general aspects of the circular economy in Brazil, the absence of specific standards hinders the technical validation of circular products and restricts their access to national and international markets. Current regulations—focused on products, chemicals, and waste—have regulatory gaps, especially regarding refurbished products such as electronics, which are discarded prematurely when they lose their warranty after informal maintenance. In order to mitigate this scenario, it is essential to promote the creation of specific technical standards for key products and sectors. In addition, coordination between government, the private sector and regulatory entities is needed to develop certification protocols and testing for circular products. Self-regulation, combined with formal regulation, can significantly contribute to align interests and adapt standards to sectoral realities, thereby creating a regulatory environment conducive to innovation and the development of circular value chains.

Finally, it should be noted that *financing* is one of the major challenges to making circular innovation viable. Small and medium-sized enterprises, which are primarily responsible for innovative solutions in the circular economy, face enormous difficulties in accessing credit. Of the companies selected as inspiring cases in the project, most used their own resources or personal networks to finance their solutions. The requirement for counterparties and guarantees by financial institutions has made access to lines of credit unfeasible and, in some cases, compromised the financial health of these initiatives. In view of this, it is necessary to review these requirements, making deadlines and criteria more flexible, as well as promoting the leading role of large companies in supporting MSMEs in their chains. A promising model in this regard is blended finance, which combines public, private, and philanthropic resources, spreading risks and encouraging investments in innovation with positive environmental and social impacts.

This financing, however, should cover not only final products, but also processes such as mapping production chains, life cycle studies, and integration between sectors. This approach favors coordination between different links in the production chains and promotes synergies, such as the reuse of waste from one company as raw material for another.

Furthermore, it is urgent to value waste as a resource. To this end, investment decisions must consider the residual value of materials, the negative impacts of the linear economy, and the economic benefits of circular activities such as repair, remanufacturing, and recycling. This change in mindset transforms costs into investments and strengthens the circular logic as a viable development model.

CONCLUSION

This article sought to identify key elements for advancing the circular economy in Brazilian value chains, focusing on challenges and opportunities for MSMEs. To this end, it began with a brief overview of the linear economic model that is currently predominant, which involves an unrealistic logic of infinite resources and is therefore unsustainable. This was followed by a discussion of a new paradigm to govern production and consumption relations, respecting the limits of the planet and promoting regeneration, namely the circular economy. After conceptualizing this model, important developments were identified that are occurring at the global, regional, and national levels, confirming that the scenario is favorable for the agenda.

However, even though the overall scenario is favorable, it needs to be tested with players who have — or do not have — practical experience of the circular economy. To this end, the following section of the article addressed data and lessons learned through the Ancorando Cadeias de Valor Sustentáveis no Brasil (Anchoring Sustainable Value Chains in Brazil) project, which worked on sustainability management, with a focus on the circular economy, among MSMEs that are part of two value chains in Brazil, in the energy and telecommunications sectors.

In this section, the degrees of maturity in the circular economy of around thirty MSMEs were first compared at the beginning and end of the project. This analysis revealed important messages. First, it was identified that most of the companies analyzed are familiar with the concept of circular economy, but only a minority of them take effective action to put circularity into practice. In addition, the data collected indicates a correlation between company size and the level of maturity in circular economy practices, as the larger companies analyzed performed better on circularity indicators. Finally, it was found that MSMEs can evolve in their understanding and adoption of circular practices through training and networks focused on knowledge exchange. This is because, at the end of the project, more than 90% of the companies analyzed reported improvements in this area. This was followed by a presentation of the challenges reported by MPMEs throughout the project, particularly in relation to the community of practice and the identification of inspiring cases. These challenges are linked to innovation, governance, the regulatory framework and financing.

In general, what we see in the sections that make up this article is that, in order to boost the circular economy in Brazilian value chains, considering the role and challenges of smaller companies in particular, it is first necessary to ensure training — so that the concept of the circular

economy and its advantages are widely known — and, from there, provide the means for that knowledge to be put into practice. To achieve this, it will be necessary to overcome the challenges identified, which will require coordination and collaboration between various actors and sectors, always using a chain logic or systemic thinking.

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BEGINNING, MIDDLE AND BEGINNING: TOURISM FOR COMMUNITIES AND THE ENVIRONMENT

Andrea Rabinovici¹, Zysman Neiman²

ABSTRACT

This article reflects on the role of tourism in the conservation of natural and cultural heritage and in the construction of other ways of being and living in the world. Between market demands and theoretical and practical concerns, tourism is becoming more specialized. Environmental degradation, environmentalism, and the market itself demand the incorporation of socio-environmental issues. Ecotourism emerges, seeking positive impacts, but not always considering the social aspect, provoking reactions from communities. Community-Based Tourism (CBT) emerges as an alternative of decolonial and counter-hegemonic resistance, centered on the social development of territories. The text discusses the challenges faced by CBT in transforming realities and promoting Bem Viver (Living Well), without attempting to resolve them.

Keywords: Counter-hegemonic tourism. Community-based tourism. Communities. Territories. Living well.

THE BEGINNING AND THE MIDDLE

We are the beginning, the middle and the beginning. Our journeys move us; our ancestry guides us (Master Antônio Bispo dos Santos).

Traveling to get in touch with nature and visit people from other cultures, with different worldviews and ways of being and living in the world, can have transformative effects.

What began as ecological tourism has, over time, been given different names: green tourism, environmental tourism, nature tourism, sustainable tourism, responsible tourism and ecotourism — terms often used as synonyms, although with their own nuances, formulated in dialogue with the terminology of the environmental movement (which has also evolved from ecological to environmental, sustainable and socio-environmental).

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Regardless of the nomenclature, what matters most are the principles that guide these practices and their commitments to the environment and local communities, seeking to minimize negative impacts and generate real benefits for the territories involved.

Non-governmental organizations (NGOs) and socio-environmental movements play an essential role in this process. Together with academia, they are responsible for creating, debating and disseminating concepts such as biodiversity, sociodiversity, ecosystems and heritage, which, with their theoretical and practical variations, express different conceptions of the world and continue to fuel fundamental debates for the formulation of national and international public policies.

These diverse paradigms that address (socio)environmental issues directly influence the typology of protected areas, the formats of environmental education, the priorities of socio-environmental agendas, and other initiatives aimed at nature conservation and preservation. Solutions to environmental problems require complex, interdisciplinary and trans-disciplinary approaches that bring together different types of knowledge, rationalities and the actions of multiple players and epistemologies in a variety of contexts.

Concern for the environment, which has been visible since the 1960s, is becoming institutionalized and is now integrated into sectors such as commerce, services, industry and tourism.

The international conferences on the environment, which began in 1972, gave impetus to environmental policies and discussions. The search for sustainable practices requires all sectors to take more responsibility and care for nature - and, further down the line, for the communities that inhabit these territories.

Worsening environmental problems result in an increase in already-known diseases and the emergence of new ones associated with the environment. Allergies, anxieties, and the “nature deficit” — described by Richard Louv in *Last Child in the Woods* (Louv, 2016) — become more common and challenging. Saving life on the planet and “postponing the end of the world”, as proposed by Ailton Krenak, have become daily challenges for all of us.

Appreciation of the environment is driving new forms of tourism, including the controversial “go before it is gone” tourism. Nature trips and traditional backpacking were already happening, but ecotourism gained momentum in the 1980s and became popular in the early 1990s, when environmental issues became firmly established on the public agenda.

The prefix “eco” now qualifies products and services as environmentally friendly—cars, clothing, food—and signals to the public a commitment to the environment. However, this is often just greenwashing, simulating an environmental responsibility that does not exist. Subsequently, the concept of sustainability emerged with legitimate (or illegitimate) concerns, serving various political agendas and priorities, while becoming institutionalized in the public and private sectors, in management processes, research, school and academic curricula.

In this process, ecotourism agencies and operators have emerged, as well as eco-resorts, focused on travel in natural environments, with activities such as hiking, bird watching, and adventure sports. Standards for ecotourism are created, as well as the “ecotourist commandments”.

The main motivations for ecotourism ³ are contact with nature and traditional cultures in protected natural areas, as well as including environmental education and interpretation activities, being organized by specialized agents and local partners, operating on a small scale and minimizing the natural and socio-cultural impacts of the places visited. It must generate economic alternatives for host communities (income and work, social benefits and improved quality of life) and raise awareness among all for the conservation of natural and cultural heritage.

Although social and cultural concerns were anticipated in ecotourism, they rarely arose in the activities, which were always focused on nature. There was an understanding that guidance, monitoring and activities would be the responsibility of biologists and ecologists.

The inseparability between human beings and nature and between social and environmental issues took a long time to be assimilated, and even today, many people still do not understand it. This combination, in the 1990s, coined the term socio-environmental, which came to be used in many contexts, including in the tense debate on the creation of the National System of Conservation Units (SNUC), which attempted to reconcile conservationists and preservationists by creating two types of Conservation Units: those for Integral Protection (without people) and those for Sustainable Use, which can have residents.

It was a conflict between biologists and ecologists versus social scientists with their paradigms and worldviews. Each had evidence to support their positions. Those who defended parks without people saw human beings as a threat; for conservationists, however, humans are allies and

³ For easier reading, we will refer to the aforementioned types of tourism collectively as ecotourism.

even responsible for what remains of socio-biodiversity on the planet. In Brazil, Professor Diegues is one of the main people responsible for defending this vision. His most emblematic book, *O Mito Moderno da Natureza Intocada* (Modern Myth of Untouched Nature), deals with this issue (Diegues, 2008). NGOs have joined this academic debate to defend both the preservationist and conservationist perspectives. These divisions influence different conceptions of environmental education and sustainability.

While this debate is taking place, socio-environmental issues are becoming increasingly popular, as is tourism in natural areas. Ecotourism has won over its audience and, in some ways, influenced other segments to improve their practices. With demand, “tourist packages” from large travel agencies began to sell the same destinations and products, adopting slogans such as “ecotourism with comfort and civilization” and offering more affordable options, for a type of tourism considered elitist. It is capitalism taking over, without necessarily following the principles and recommended practices of ecotourism. The experience is now marketed from a utilitarian perspective.

As a counterpoint to mass/conventional tourism — in which ecotourism itself has become part of — tourism is reinventing itself. New modalities are emerging and, over time, a range of activities has developed that, in addition to offering alternatives, present themselves as counter-hegemonic and decolonial.

Neiman (2022) presents a critical view of ecotourism in Brazil, highlighting the impacts of mass tourism and the response of environmentalism through the creation of Conservation Units. He defines ecotourism as a three-pronged approach: environmental education, local benefit, and conservation. He criticizes commercial appropriation and proposes Community-Based Tourism as a counter-hegemonic alternative, valuing self-management, solidarity economy and community leadership.

Were ecotourism promoters really concerned about and actively involved in the social and cultural issues of the communities they visited? And what about the tourists? Clearly, in most activities, there was no such concern or care, and it was common to see a total disconnect from social and cultural issues. And the activities had more negative than positive impacts, both culturally, socially and even environmentally.

The lack of concern for local communities will cause unrest and revolt, especially among community members. Community integration became something that was defended and demanded. NGOs themselves, having committed to the socio-environmental agenda, began working towards this goal, either out of principle or because funding agencies required them to incorporate communities into their projects. It was all or nothing!

The context was set for Community-Based Tourism (CBT) to become the most socially conscious branch of tourism, while still encompassing environmental issues. At first, there was talk of solidarity-based, responsible, sustainable, locally-based, community-based tourism, among other terms, until CBT became established as the most widely used terminology, meaning:

... a model of visitation management led by the community, generating collective benefits, promoting intercultural experiences, quality of life, appreciation of the history and culture of these populations, as well as the sustainable use of the Conservation Unit's resources for recreational and educational purposes (ICMBio, 2019, p. 20).

In CBT, local communities take the lead in planning, managing and implementing activities. Inside or outside protected areas, this model values local culture, promotes social inclusion and seeks economic sustainability.

What changes? Even with social and environmental concerns, alternative tourism seeks to generate income, work and social inclusion, but in a sustainable and more shared way, inspired by the logic of social entrepreneurship and the solidarity economy. The focus is on quality of life, Living Well and the rescue of community life and collective identities against historical exploitation by external agents and the market. Could this be a counter-hegemonic and decolonial practice?

Some movements are helping to mature this reflection. World Social Forums, for example, announced that "another world is possible", inspiring the thought that "another tourism is possible". Socio-environmentalism, agroecology, solidarity economy, proposals for Living Well, and critiques of capitalism and the hegemonic model of development point to "another humanity". Thus, insurgent movements converge to build a fairer and wiser world, where all beings can live better.

New and old utopias influence tourism, provoking experiences and experiences that open space for "new beginnings and middles". Initiatives to "hack" tourism and transform its dynamics are gaining momentum, such as slow tourism, which proposes traveling at a different pace, prioritizing experiences and connections, resistance tourism, slum tourism, Afrotourism, among others.

Despite their utopias and hopes, the communities continue to look for ways to survive within the logic of sustainability - out of conviction or because they live in protected areas that restrict their options. At the same time, they face pressure from the market and tourists looking for exclusive and "exotic" experiences, which supposedly could solve their problems. A complex scenario of interests and expectations is emerging, requiring creative and resistant responses.

At the same time, forest peoples — indigenous, riverine dwellers, quilombola and others — gained visibility and some legal guarantees with the 1988 Constitution, such as the right to “definitive” possession of their lands, even though they remain threatened by land grabbers, setbacks and illegal exploitation.

CBT in indigenous communities, also known as ethnotourism, will be promoted by Funai, via Normative Instruction in 2015⁴, which regulated norms and rules for visiting villages through the approval of a visitation plan. These are very recent, controversial experiences, but they are already the subject of tourism campaigns by the federal government itself, such as the *Experiências do Brasil Original* (Original Brazil Experiences) project⁵.

As always, generating income from these activities both encourages local communities to look for alternatives and attracts conventional tourism companies in search of new products and attractions. The global market, social networks and all the connectivity, publicize the experiences that are sought after, but there are limits to the natural and cultural heritage that can be offered as attractions. But voracity, demand and greed lead to the creation of others, as if they were infinite.

For this reason, Ernest Cañada (2024) states that community tourism is in a context of disputes. From Fordist to post-Fordist capitalism, the way of organizing tourism has changed, especially since the 1990s, in search of differentiation, and among the “fragments” are the modalities and segments of tourism. He explains:

... we seek to differentiate ourselves from others. In this context, everything becomes a tourist attraction, from landscapes and places threatened by climate change to places of poverty. And so, community-based tourism finds itself in dispute. Because, on the one hand, the goal of marginalized and impoverished communities is to have control over tourist activity, but at the same time, what they are offering becomes an object of interest for outsiders (Cañada, 2024, p. 18).

In this sense, both the market and communities are fragmenting the activity. However, communities can do so thoughtfully, in a network, to share challenges and achievements. At the same time, they learn how to deal with consumers and the tourism market, either to resist it or to take advantage of it, “hacking” tourism in their favor. Whatever the bet, the

4 <https://www.gov.br/funai/pt-br/arquivos/conteudo/ascom/2015/doc/jun-06/in-03-2015.pdf>

5 <https://www.gov.br/turismo/pt-br/acesso-a-informacao/acoes-e-programas/programas-projetos-acoes-obras-e-atividades/experiencias-do-brasil-original>

risk of being absorbed by the market is there. It is very difficult to escape the “system”, and the alternatives are more likely to become niche markets for demanding tourists.

To counteract this, it is essential that the community is organized and articulated and can propose its own tourism programs, via politically articulated groups, collectives and Social Organizations. This was already happening in rural areas, and more recently, CBT has emerged in urban contexts, as shown by the Itinerários de Resistência (Resistance Itineraries)⁶ project by Sesc SP. CBT that has come to cities is already a consequence of this resistance movement.

The motivations of the communities are diverse and they appropriate tourism using it as a tool or social technology in search of alternatives. Ernest Canãda (2024) lists some of the motivations behind CBT in communities on the outskirts and in the slums of large cities, which, in their own way, see CBT as a form of struggle and resistance. Far beyond generating income and employment, CBT proposals aim to form a safety net against various perceived threats. To this end, visibility, partnerships and alliances with people and institutions outside the community are key. Fighting the stigma with which they are associated is also a challenge for CBT.

Everyone wants to improve their quality of life, to stay ahead of existing or new businesses. There is a concern not to gentrify their spaces, not to be exploited, and to be able to continue living in their territories without an increase in the cost of living due to tourism. In slums, indigenous communities, and elsewhere, the concern is the same. One side effect observed is that the presence of tourists discourages violence, illegal mining, fishing, and logging, land invasions, among other things, which can result in greater environmental protection. In addition, the presence of tourists compels public managers to meet local demands for infrastructure.

Other common activities also result from socio-environmental conservation, such as the production of handicrafts, biojewelry, and food for sale, using natural elements from their territories. The processes for collecting and extracting materials from nature are usually sustainable, based on knowledge learned and passed down through the generations.

Community-Based Tourism (CBT) values the role of indigenous peoples, quilombolas and traditional populations in conducting tourism activities linked to their ways of life and territories. It is in line with the concept

6 Itineraries of Resistance: unraveling community-based tourism in SP. Available at: <https://www.sescsp.org.br/editorial/itinerarios-de-resistencia-desvendando-o-turismo-de-base-comunitaria-em-sp/>.

of sociobiodiversity, understood as the integration of biodiversity and sociocultural diversity, according to the National Plan for the Promotion of Sociobiodiversity Chains (PNPSB). Both share principles such as valuing local practices, sustainable use of resources and strengthening community autonomy. CBT is also linked to national bioeconomy policies, such as the BioRegio program and the National Bioeconomy Strategy, by promoting sustainable and inclusive value chains, based on traditional knowledge and social innovation, consolidating itself as a legitimate vector of the bioeconomy guided by social justice and environmental conservation.

But how can we maintain consistency in CBT principles and practices amid everything that has been presented? When CBT is successful, what is the limit between communitarianism and the commercialization⁷ of everything? What is the scale of use of nature, labor, and profit that allows its principles to remain in use?

The idea of “small is beautiful”, brought by Ernst Friedrich Schumacher in the 1970s in reaction to economic acceleration and the idea of unlimited market growth, reappears in a new guise to address the necessary limits for the use of finite natural resources. Just as there are limits such as load capacity for trails, one wonders what the load capacity would be for visiting communities without them losing control and protagonism. And how to deal with the seduction — or harassment — of capitalist logic, even if it is “sustainable”? Most of humanity consumes goods of all kinds, including art, landscapes, etc., and is constantly changing culturally with new ideas, trends, and fads. Why would it be any different for other communities and their cultures? Can the success of CBT be measured by the increase in income of a few? By the same indicators of success used in conventional tourism, such as occupancy rates for accommodation? Success can be failure, it can generate inequalities and new conflicts, including the decharacterization of communities and places.

In a networked world, the desire to move is not limited to travelers. How can we think about this in fixed communities, with people who have never left — physically — their territory? The risk is high, even when communities are fighting and resisting, wanting to be decolonial and counter-hegemonic, with the autonomy and empowerment that alternative activities such as CBT can bring.

⁷ For further reflection on this topic, see Rabinovici, 2024.

TRAJECTORIES THAT MOVE

Innovative experiences expand the concepts, principles and practices of these alternative forms of tourism, which specialize according to the territories and communities. So, even if you do not follow all the principles of CBT to the letter, it is not always possible or desirable to stick to them. After all, does it make sense for CBT to be in the hands of external agents? What if they are long-standing community partners and the community wants them to be? Who sets the rules? Based on these premises, it is necessary for the community to organize itself, take ownership, define the rules and how it wants to be visited, including decisions about the profile and number of tourists, the calendar and fees to be charged, the distribution of work and income, transparency in the use of resources, etc. Thus, they can also innovate and remove or add premises for the activity, so that they are appropriate to their reality. If it belongs to the community, the decisions should be theirs.

There are CBT experiences that are sustainable and supportive, with recognition of their cultures, a sense of belonging and retention of young people, with shared experiences between tourists and hosts. They care for the environment without slipping into cosmetic and for-sale environmentalism. They focus on dialogue and emotional experiences, convergence and personal transformation. On the other hand, there are simulacra, with “authenticities” being staged in shows for tourists. There can be processes of transformation and homogenization of spaces, known as gentrification, and its touristic facet, which is touristification, in which the whole territory is turned over to tourism.

Each community is unique, and the understanding of what tourism is varies, as do the concepts and practices of participation, community, economy, etc. This is the richness and challenge of CBT: emancipation, with autonomy and freedom, without imprisoning or imposing anything on communities, only dialogue, developing collaborative projects, practicing new forms of tourism and, perhaps, other ways of living.

These qualities should influence the other segments of tourism and perhaps the market as a whole. Is that possible? Cañada (2024) believes that “we can think about and organize tourism according to the needs of the majority of the population, with the aim of social emancipation”. And what is the population thinking?

Whatever its form, tourism has an impact on territories, their cultural and natural heritage, both tangible and intangible. Most of the territories where CBT takes place are legally protected areas (Indigenous Lands and environmental protection areas), and the people who live there have their rights guaranteed by law. Despite the existence of such rights, even the

most basic ones are always in dispute, such as the issue of the time frame. There are political and commercial pressures and environmental threats such as climate change. That is why CBT is so important for everyone. It allows human beings to unite with each other and with nature in an attempt to give new meaning and direction towards Living Well and socio-environmental sustainability.

WHAT CAN WE EXPECT FROM TOURISM FOR THE ENVIRONMENT?

There is nothing better than imagining other worlds to forget how painful the one we live in is. At least so I thought then. I hadn't yet realized that, imagining other worlds, you end up changing this one (Umberto Eco).

This quote from Alberto Acosta's book *O Bem Viver: uma oportunidade para imaginar outros mundos* [Living Well: an opportunity to imagine other worlds], leads us to think that, in addition to imagination, real contact with other ways of being and being in the world must happen, whether through literature, the arts, social networks or travel. In the encounters promoted by tourism, people can experience different ways of life, which can inspire the transformation of their territories.

Acosta (2012) proposes a break with capitalism and its developmental paradigms, in order to allow "Living Well", a model of life that reestablishes the union between human beings and between them and nature, valuing ancestry, after all, as Ailton Krenak states, "the future is ancestral". To do this, we need to overcome "neo" forms of liberalism, colonialism, and extractivism, drawing inspiration from diverse, post-developmental, non-hegemonic democratic experiences.

According to Neiman and Patrício (2010, p. 86), "visitation is a way of bringing society and protected areas closer together and awakening their interest in their conservation, having a direct effect on the adoption of different behaviors and policies favorable to the protection of the environment...". The authors understand that "Tourism, combined with Environmental Education, is, therefore, an indispensable tool in any strategy, public or private, in the search for sustainability" (p. 102).

For Rabinovici and Irving (2015, p. 152), "the process of biodiversity conservation could be strengthened by a sense of belonging to nature (resulting from critical awareness of the issue at hand) and by understanding its significance in the daily lives of the groups involved." Tourism can provide this contact with nature and, if done well, it has the capacity to revolutionize the way we deal with the environment, enhancing its value.

The premise of ecotourism is to value, care for and protect the environment and societies, but the reality is that most of the time it doesn't

promote contact with the territory, favoring and promoting the consumption of objects and landscapes, generating new conflicts and disputes.

With objectives and proposals that go against the market, CBT and its variations can become an opportunity for encounters, discoveries, experiences, confluences, exchanges and affection. It will not be rushed consumer experiences that will result in transformation. Tourism combined with the utopia of Living Well goes against this path.

These other forms of tourism already exist, they are found where we least imagine, and are carried out by young people from the outskirts, favela communities, indigenous people, quilombolas and others who take on the role of resistance and transformation. New players thinking about and promoting tourism have the possibility of subverting destinations, tourists and those visited. Would this be hacking tourism?

The lessons learned are numerous and endless, and the consequences go far beyond generating income, with valuable lessons learned through conversations and physical and imaginary journeys. Ethical approaches to tourism are possible and have the potential to contribute to the decolonization of minds, people, and territories, as well as to the conservation of natural and cultural heritage.

Such experiences invert concepts, re-discuss attractions, question what is the center and what is the periphery, building itineraries committed to guaranteeing citizenship, the right to the city, but also the right to the forest and the countryside.

The incorporation of sustainability principles into tourism has been happening since the 1990s, and it is necessary to broaden perspectives so that this can be achieved in light of the enormous impacts that mass tourism itself has, causing biodiversity loss and climate change.

Traveling with a different mindset can be a real opportunity for change. They can help bridge the gap between humans and nature, and between humans themselves and their spiritual lives, which is at the heart of many communities, especially indigenous peoples. Emotional exchanges, sharing knowledge and skills can subvert purely commercial exchanges. It is not easy, but it is possible.

And here we are, once again, at the beginning.

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SUSTAINABILITY FROM THE PERSPECTIVE OF THE SATERÉ PEOPLE

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ABSTRACT

This article discusses sustainability from the perspective of the Sateré-Mawé people, highlighting their own concepts, knowledge and technologies as the foundations for sustainable practices. Based on an approach that integrates knowledge and everyday relationships with everything around them, we seek to understand how the Sateré-Mawé's relationship with the forest, land, rivers, animals and the "invisible beings" that inhabit the domains of the earth, the forest and the water complement each other through a way of life based on reciprocity and the ethics of care.

Keywords: Sateré-Mawé. Knowledges. Reciprocity.

INTRODUCTION

Sateré-Mawé people live mainly in the middle Amazon River region. Most of the population is concentrated in indigenous lands officially demarcated and approved on August 6th, 1986, whose demarcation process began in 1978 after intense demands and pressure from the Sateré-Mawé people on the National Indigenous People Foundation (Funai), having been victims of invasions by logging companies, oil companies and farmers.

The territory is located on the banks of the Andirá and Marau rivers, tributaries of the Madeira and Amazon rivers, and is characterized by rich biodiversity and vast areas of forest. The region is difficult to access and travel is generally done by river.

In addition to the Andirá-Marau territory, there are also Sateré-Mawé people living in urban areas, especially in Manaus, for the purposes of study, work or fighting for rights, but many maintain ties with their communities of origin.

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With the demarcation of land, there was a significant change in territorial protection. Based on this legal framework, the presence of logging companies in the region was prohibited, which guaranteed greater autonomy and security for indigenous communities in exercising their cultural practices and caring for local ecosystems. The removal of logging companies represented progress in environmental preservation and in strengthening the sovereignty of the Sateré-Mawé people over their territory.

The seduction exerted by the immediate promises of profit from indiscriminate logging, often driven by external pressures and economic interests, has given way to a collective process of awareness. The Sateré-Mawé people have rediscovered a deep appreciation of the value of their territory, understood not only as physical space, but as a living, interdependent organism.

This renewed awareness of the importance of the forest and everything in it — plants, animals, rivers and memories — has strengthened ties with traditional knowledge and wisdom, promoting sustainable practices for managing and coexisting with nature and the beings that inhabit it, based on relationships of reciprocity and mutual respect.

The removal of the logging companies was not only an act of environmental protection, but also a gesture of resuming the Sateré-Mawé way of life, in which the territory is a source of life, knowledge and future.

TERRITORY AS HOME TO MANY BEINGS

For the Sateré-Mawé people, the territory is a space inhabited by many visible and invisible beings, who coexist with humans in interdependent systems, in addition to the things that are called forest, land, water, animals and plants. The “invisible beings” that inhabit the domains of the earth, the forest and the water are responsible for taking care of everything that exists. Just as we humans take care of our homes, our animals and our crops, they take care of things.

Coexistence and cohabitation are based on reciprocity, exchange and the ethics of mutual care, and the violation of these relationships of reciprocity can cause imbalances that manifest themselves as diseases, scarcity, intense storms, excessive flooding of rivers and conflicts.

The territory, therefore, is not just a physical or geographical space, but a living space of coexistence and cohabitation, where humans and invisible beings share and live together in a network of relationships based on reciprocity, respect and mutual care. In other words, the territory is a cosmopolitical home insofar as it is inhabited by humans and the invisible

beings who take care of everything. Invisible beings observe, interact and teach. But when disrespected and when we take things under their care without permission, they react and attack.

On the other hand, the forest, the land, the rivers, the animals and the plants have their own agency, their own defenses. Thus, everything that exists is not a resource to be exploited, but an entity with the capacity to react and protect itself. This dimension is very difficult to understand for people who are not familiar with this epistemological model.

Sateré-Mawé people consider and recognize that the balance of their territory and of the terrestrial world depends on the maintenance of this network of cosmopolitan relations. Breaking this relational pact means creating environmental imbalances with serious consequences, whether through the spread of disease, scarcity of resources or the occurrence of devastating natural phenomena.

Environmental sustainability has been widely debated in different academic contexts, in business and politics, often associated with the search for a balance between economic development and environmental preservation.

However, for indigenous peoples such as the Sateré-Mawé, this notion is rooted in their own conception and practices involving relationships of reciprocity, respect and interdependence with all “invisible beings” that inhabit the domains of the earth, the domain of the forest and the domain of water, which are responsible for taking care of the things that exist in the territory, that is, what is called the forest, land (minerals), water, animals and plants.

TIME MANAGEMENT AND SUSTAINABILITY AS RELATIONAL ETHICS

The Sateré-Mawé people organize their way of life around natural cycles: the time to plant, the time to harvest and the time to let the land rest. Abundance is celebrated in festivals during the transitions between constellations, moments when symbolic exchanges take place between humans and invisible beings.

The ethics of care and reciprocity underpin social and cosmological relations in the conception of the Sateré-Mawé people. Disrespecting the invisible beings that inhabit the forest, the land, and the rivers, hunting unnecessarily, or polluting the rivers is breaking the pact of coexistence and putting the community at risk.

The management of guaraná (waraná) is a notable example of how sustainability is rooted in the Sateré-Mawé way of thinking. According to the story, guaraná originated from the eyes of a child, the son of *gente-cobra* (snake people), carrying with it a deeply human and cultural dimension (Uggé, S/N). Its cultivation follows natural cycles and involves dialogue with the owners of the guarana plant before planting, dialogue with the land to ensure it is fertile, forest management and manual harvesting.

These techniques are passed down orally between generations and represent not just a way of planting and harvesting, but a way of life. Guaraná is part of a knowledge system that articulates sustainability, memory and economy, demonstrating how the Sateré people live and update their knowledge and concepts. Guaraná is one of the beverages that speaks to indigenous knowledge, present in all social practices carried out by the Sateré-Mawé people. It is the source of knowledge and intelligence. It is coexistence and living in harmony with nature itself.

Guaraná represents not only a food, but also a symbol that integrates the cosmopolitan, social, economic and cultural aspects of Sateré-Mawé life. Therefore, it is a living expression of the indigenous knowledge system and ethics of caring for the forest, the land, water, animals and plants.

Taking care of the land, the forest and the rivers is also taking care of the community itself. Everything that exists in the territory has its owner, its guardian. Respecting these guardians means maintaining the balance of the environment. The breakdown of this ethic, such as excessive hunting, unnecessary deforestation, or river pollution, is a violation that puts everyone at risk.

Sustainability, then, is not just an ecological practice, but a principle that guides the rhythm of life. Respecting the cycles means guaranteeing the balance and continuity of existence.

FEMININE KNOWLEDGES, SONGS AND SUSTAINABILITY

Songs play a central role in the relationship with invisible beings, with the forest, with the earth, with rivers, with animals and with plants. Sateré-Mawé women use songs as a form of communication with invisible beings, animals, and plants. They sing as they plant their crops and sing to nourish the earth. By listening to birdsong, they interpret what may happen, whether good or bad.

The song of the great kiskadee, for example, signals something good, a sign of joy, a sign of well-being among all.

One day, several great kiskadees woke up singing in perfect harmony, unlike other days, standing out among the songs of other birds. Upon hearing their synchronized singing, I asked Mrs. Angelina about it. She replied that the great kiskadees had someone who took care of them. They were singing to thank them for everything they did for them. It was also a sign that the community was well, that no one was sick or sad. It was a sign that everything was at peace.

The interlocutor also said that the great kiskadees sometimes sing to warn people about something unusual that was about to happen to someone or the community. But it was necessary to know how to interpret the song (Ramos, 2021, p.118).

The songs and dances of the *tucandeira*, performed during the social initiation of adolescents into adulthood, convey knowledge, wisdom, resilience and collective identity. Songs have an educational and communicative function. Singing is, for the Sateré-Mawé people, a way of educating, caring for, communicating and organizing the world to ensure balance.

Women, in particular, play a fundamental role by singing to the crops, to children and by listening to birdsong. Their songs nourish not only the soil, but also the memory and fertility of the land. Children participate and learn, becoming the future guardians of songs and knowledge.

Singing is sustaining life, invoking protection, warding off diseases and strengthening the community. Singing is caring for the territory, communicating with invisible beings and communicating with animals (birds) and plants to ensure that life continues in its multiple flows. The notion of sustainability, in this sense, is inseparable from musicality. Every song is a form of communication, as Ramos (2021) highlights in her dissertation.

According to Angelina, singing while working in the fields was her way of getting close to the animals and counting on their help. For example, when they are in the countryside and hear the toucans singing, they start to imitate. Imitation, according to Angelina, is a way of communicating with them. In this way, the more they imitate the song, the closer they seem to get to the birds, in the sense that they can count on their protection when they are alone in the fields.

The songs of birds are important to us, the Sateré-Mawé people, because through their songs they can convey sad or happy news, a warning of something unexpected that is about to happen to someone we know or to our own family (Ramos, 2021, p.113).

Ramos (2021) also talks about the way of communicating with the forest, that is,

In addition, my mother told me that the rustling of the trees caused by their movements when hit by the wind were the songs of the forest. And the noise of the tree branches rubbing against each other was the scream of the woman who had died with her arm stuck in the hole in the tree trunk left by her betrayed husband as a trap. Similar stories were told by older people, including my grandparents and parents (Ramos, 2021, p. 29).

Singing, planting, sharing, respecting time, caring for the land — these are the ways to ensure the continuity of life with dignity and balance. Sustainability, for the Sateré-Mawé people, depends on the network of relationships we maintain between humans, invisible beings, animals and plants.

Another principle of sustainability for the Sateré-Mawé people is collective life. The land is collectively owned, food is shared, and work is done collectively. The well-being of the community is above individual accumulation. This way of life contrasts with the Western model, based on individualistic logic and the exploitation of nature.

The spirit of collectivity ensures that decisions regarding the use of “natural resources” within the territory take into account the common good and guarantees for future generations. Sharing is a practice of balance and continuity that ensures mutual respect, strengthening community ties and the use of technologies that do not cause damage to the territory.

Considering that the territory is inhabited by humans and invisible beings is not a concept unique to the Sateré-Mawé people. This concept is shared by the indigenous peoples of the Amazon, where the territory is not just an “environment”, but a living space populated by invisible beings and by the forest, the earth, animals, and plants with their own agency. This reinforces the understanding that indigenous knowledge is plural and, at the same time, intertwined with similar principles of coexistence with others, whether visible or invisible beings, who inhabit the forest, the land and the water.

Davi Kopenawa (2015), for example, in his book *The Falling Sky*, says that there are xapiri beings that inhabit the forest domains and

They are the owners of the forest and the water courses. They look like humans, have wives and children, but live at the bottom of rivers, where they live in large groups. They really are excellent hunters! They relentlessly follow their paths through the forest, shooting arrows at macaws, toucans, parrots, hëima si birds and all other types of game. (Kopenawa; Albert, 2015, pp.101-102).

In Kopenawa's book, we see a description of the beings that inhabit the rivers and forests: they are like humans — they have families, hunt, organize themselves — but they live in invisible or underground realms.

In the same vein, Bruce Albert [...] presents,

The *xapiri pë* spirits live high up in the mountains. Some live inside them. There are *xapiri pë* everywhere in the forest. Others live in heaven. Still others live underground. They are very numerous, which is why their paths branch off in all directions. They shine brightly and are covered with dazzling white feathers. They are as thin as the threads of the webs of the great warea koxi pë spiders (Albert, 2023, p. 101).

The description of the *xapiri pë* — spirits that shine, live in different layers of the world (mountains, sky, underground) and move along branching paths — suggests a dynamic and interconnected relationship. These spirits not only exist, but are active, present, numerous and fundamental to the balance of the Yanomami world. Their lightness (“as thin as spider webs”) and luminosity symbolize a subtle but essential type of power.

Both the owners of the rivers and the *xapiri pë* are endowed with agency: they hunt, move around, shine, and build relationships. This highlights a central feature of Amerindian cosmology: the notion that many beings share the condition of being a “person”, albeit in different bodily forms.

Another author, the indigenous anthropologist researcher Barreto (2012), from the Tukano ethnic group, highlights in his dissertation work that, in the conception of the Yepamahsã (Tukano), all spaces, that is, “environments” are inhabited by beings called *waimahsã* in their language. He says,

It is worth mentioning here that any space is the domain of *wai-mahsa*, they are their residences (*bahsakawi*), and all beings, animals, plants and minerals present there are their responsibility and protection. Access to these spaces (and their “natural resources”) necessarily requires submission to a series of practices, behaviors, etiquette or good manners guided by a specialist (*yai*, *kumu* or *baya*), who has the ability to establish communication with the *wai-mahsã*. This ability translates into the domains of *kihti* and the conceptions and practices of *bahsesse*, *ukusse* and *bahsamori* (Barreto, 2012, p. 44).

This quote offers a very rich basis for reflection on notion from an indigenous perspective. The Tukano conception that all spaces are inhabited by *waimahsã* beings and that the “environments” are their “residences” reveals that territories are made up of dwellings for humans and invisible beings. And the idea that forests, land, water, animals, and plants have agency contrasts sharply with the modern Western view, which often sees nature as a “resource” to be exploited.

This view alerts us to have an ethic of deep care for the environment, not because of legal impositions or economic interests, but because of a relational, respectful and collective understanding of the world.

Access to environments and their “natural resources”, in indigenous conceptions, requires submission to specific practices, especially the mediation of specialists (shamans) and respect for environments that are homes to invisible beings. This establishes a traditional form of socio-environmental governance, based on coexistence and social harmony. This logic is highly sustainable, as it restricts the indiscriminate use of resources, imposes clear limits and reinforces collective responsibility for ecological balance.

Another important point is that this indigenous conception breaks with Western dichotomies between nature and culture, human and animal, visible and invisible. Here, the forest is perceived as a space of coexistence and cohabitation between multiple beings and worlds.

In times of environmental destruction, indigenous conceptions show that true sustainability is not measured in numbers or carbon targets, but in the quality of relationships between beings. Like them, we need to listen to the songs — of birds, forests, women, rivers — and learn from them to live with lightness, reciprocity, and respect.

Sustainability, therefore, does not refer to an economic and ecological balance along Western lines, but to a relational, ethical and reciprocal way of life that is deeply connected to all the beings that inhabit the forest, the land and the rivers.

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AMAZON REGION AND BLACKNESS: NOTES TO UNDERSTAND BLACK INVISIBILITY

Davi Pereira Junior¹

ABSTRACT

This essay discusses the ‘disconnection’ between Black bodies and Amazonian bodies, or Amazonian people. My goal here is to problematize this “disconnection,” which, from my point of view, has to do with common sense, and how academic common sense has made hegemonic the idea that there are no Black people in the Amazon, or rather that Black bodies are ontologically incompatible with Amazonian bodies. Even if, from a historical point of view, these statements cannot be sustained, since historical data show large numbers of Black people in slavery who were brought to the region. In addition, official population statistics show that the Amazonian population is composed of more than 75% of people who self-identify as Black, and that nearly 40% of the quilombola population lives in the Legal Amazon, with more than 60% of quilombola territories located in the region.

Keywords: Amazon, Blackness, Quilombolas, Territory

INTRODUCTION

One of the major challenges today for those studying Blackness² or quilombola communities in the Legal Amazon³ is precisely to explain the relationship between Blackness and the existence of a Black and quilombola ancestry in the Amazon region. In this sense, if we were to propose a simple exercise—even a random one—about the Amazon, asking people what kind of body comes to mind when they think of the region, it would be unlikely for anyone to say that the Amazon is synonymous with a Black body, even though the population of the Legal Amazon overwhelmingly identifies as Black.

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 - 2 I am considering the concept of blackness as conceived by Césaire (2010,) who views it as a consciousness and resistance rooted in the recognition and affirmation of Black identity and history, in opposition to cultural domination and the imposition of external values. It is, therefore, a movement that seeks to affirm Black identity and to value African culture, while rejecting cultural assimilation.
 - 3 The Legal Amazon was formally established in 1953 through Law No. 1806, with the goal of promoting development in the region. Its boundaries, which cover an area corresponding to 59% of the Brazilian territory, have been adjusted over time and are currently defined by the Superintendency for the Development of the Amazon (SUDAM,) which is also responsible for its administration.

Our essay aims to demonstrate, through the historical lens of the forced African diaspora and the movements of the transatlantic and internal trafficking of enslaved Black people, the decisive role of Africans in the formation of the population of the Legal Amazon. In addition, it is important to highlight the ancestral connections between quilombo communities and the forest, bearing in mind that these communities emerged in the Amazon through the self-organization of enslaved Black people, as part of their resistance against the institution of slavery. Today, these communities mobilize politically, epistemologically, and spiritually through radical practices to protect their ways of life, their ways of being, and their Amazonian territories. Even so, their ecological practices and contributions to the protection and preservation of the Amazon biome remain invisible.

Considering the historical relationship between the formation of Brazilian society and the enslavement of Africans, this ought to be regarded as a false dilemma; however, this is not necessarily the case. It is evident that there appears to be a certain concession that dissociates the Amazonian body, or *amazônida*, from the concept of Blackness. As if we were faced with an ontological condition in which the Amazonian body could not be a Black body. I would argue that, in our society, this way of thinking is deeply ingrained both in common sense and in academic common sense (Bourdieu, 1989). Whenever debates arise regarding Blackness in the Amazon, Amazonian Black bodies, or Black Amazonian ancestry, one of the first issues to be problematized and demonstrated is precisely the relationship that Black people have with the region and with the biome/forest and its protection.

This demonstrates the operation of certain interpretative frameworks that have become hegemonic in the case of the Amazon, which deliberately deny the existence of, or the relationship that Black people have with, the region. When they do not outright negate the 'presence' of Black people in the Amazon, they diminish the significance of their epistemological, cosmological, ecological, and other contributions, as noted by Chambouleyron (2006.)

Firstly, the idea that African labor was insignificant should be reconsidered, given that the 'backcountry drug trade cycle' is often assumed to have relied exclusively on indigenous labor. Secondly, there has been insufficient reflection on the 'various agrarian enterprises' in the region, which depended on enslaved labor. And finally, the tendency to explain the Amazon through the plantation model typical of the sugar-producing regions. Precisely because the Amazon did not fit into this model, the Black individual 'became an absent element in the construction of Amazonian society' (p. 80.)

These interpretive frameworks, rooted in a scholarly common sense, tend to essentialize Amazonian bodies as predominantly synonymous with Indigenous bodies or of Indigenous descent. As a result, they convey the impression that the entire ancestry, epistemology, and cosmology of the Amazon necessarily follow this same logic. It is important to emphasize that our intention is not to cast doubt on the relationship between Indigenous peoples and the Amazon, nor on their struggles for the preservation and protection of the biome. Likewise, we do not seek to question whether their bodies, knowledge systems, and ancestries represent or not the idea of the Amazon or being Amazonian. I believe it is not appropriate to pursue that line of discussion, as I consider it a rightful and well-deserved recognition.

The debate I intend to raise concerns the diversity of knowledges, bodies, and ancestries ancestrally rooted in the Amazon, which therefore must be acknowledged and understood as bodies also shaped by African-based epistemologies and cosmologies—dimensions that have been historically rendered invisible.

To this end, I intend to argue from at least two perspectives: first, the existence of a large Black population living in the Legal Amazon region; and second, the significant number of quilombola communities that have rooted their ancestry in the Amazon, emerging from the crime of slavery, which imposed a diaspora⁴ to thousands of Africans. In their resistance to the oppression and violence to which they were subjected, these individuals formed Afro-diasporic organizations—or rather, institutions of resistance and confrontation against the institutionalized enslavement that dehumanized their bodies. The Amazon thus became a place where they could rebuild their lives, or a territory in which they envisioned the possibility of reimagining the notion of community and, through that, reclaiming their humanity.

Our challenge in this essay, therefore, is to reveal a side of the Amazon that has been rendered invisible by racism—one that does not acknowledge a diverse Amazon, much less a Black one. As a result, Amazonian bodies are often dissociated from the very idea of Blackness. The essay will address the relationship between quilombola communities and their ancestral ties to the Amazon. Attempting to understand how this social

4 Every time I use the term 'diaspora,' I am referring specifically to the 'forced diaspora'—namely, the historical period marked by the displacement of Black people from the African continent during the transatlantic slave trade, who were brought to Brazil and sold as 'slaves'. Although it is publicly known that African Black people were victims of colonialism and that their bodies and lives were treated as commodities during the transatlantic slave trade, I find it necessary to state this explicitly.

group—and its Black, Amazonian body—has been deliberately marginalized in discussions of ‘belonging’ to the Amazon, as well as in the recognition of its contributions to the protection and preservation of the forest and its biodiversity and the very notion that these bodies have played a fundamental role in the fight against climate change, through their ways of life and the relationships they establish with the territory—relationships grounded in the rational use of natural resources, which allows these communities to sustain their physical, economic, social, cultural, and religious reproduction, and thereby claim the possibility of planning for the future. This condition is only threatened by the actions of the Brazilian State, which fails to fulfill its constitutional obligation to ensure the legal recognition of these communities’ territories—an obligation that must be understood as a fundamental right.

To this end, we will approach two perspectives: one with a more historical focus, related to the process of forced diaspora experienced by Africans brought to Brazil during the transatlantic trade of human beings from the African continent to the ‘Americas’—a system orchestrated by the major European colonial powers and their allies to sustain the colonial economy, which was based on a triad of enslaved Black labor, monoculture, and large landed estates.

The second perspective to be addressed concerns the formation of quilombos in the Amazon and the new possibilities for conceptualizing the quilombo as a space that enabled the enslaved person who managed to ‘escape’ captivity to, among other things, reclaim their ‘humanity’. This essay will also reflect on the deep-rooted connection between quilombola communities and the Amazon, as well as their ancestral relationships with the forest and its natural resources, emphasizing their contribution to the preservation of the Amazon in contrast to dominant narratives that continue to erase or obscure the historical and ancestral ties of quilombolas to the forest.

THE INTRODUCTION OF ENSLAVED BLACK LABOR

The history of the arrival of Africans in the Amazon necessarily involves the ports located in the provinces of Maranhão and Pará (Lago, 1822; Lisboa, 1865; D’Evreux 1874; Viveiros, 1977; Lima, 1998.) It is primarily through these two important provinces that a large contingent of Africans, brought under conditions of enslavement, entered the region now known as the Amazon. For the purpose of this analysis, however, we will focus on what is currently defined as the Legal Amazon, which stretches from the state of Maranhão to the state of Mato Grosso. It is important to highlight that, due to its geographic—or rather, geopolitical—location,

Maranhão became a site of colonial dispute among the French, Portuguese, and Dutch during the first half of the 17th century (Cardoso, 2011). With a geographical location considered privileged (Lisboa, 1865; Lago, 1822; Lopes, 1957; Viveiros, 1977; Lima, 1998; Cardoso, 2011,) it lay along the route that allowed access to the Amazon and the mines of Peru (Lopes, 1957; Branding; Zilberay, 1971; Viveiros, 1977; Lima, 1998,) also called Eldorado—a place sought by Europeans, fueled by imagination and hope.

The introduction of enslaved Africans in a ‘massive’ way into the Amazon region occurred mainly through the *Companhia Geral de Comércio do Grão-Pará e Maranhão* (General Company of Commerce of Grão-Pará and Maranhão)⁵ (1755-1778), as part of the Pombaline Policy⁶ to develop the region of Grão-Pará and Maranhão. However, the metropolitan government had previously attempted to implement other initiatives⁷ in an effort to provide enslaved ‘labor’ and stimulate transatlantic trade between the metropolis and the colony. Enslaved Africans were introduced to this region of Brazil as a replacement for enslaved Indigenous labor, which was prohibited in 1755⁸ by the Marquis of Pombal.

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- 5 The *Companhia Geral de Comércio do Grão-Pará e Maranhão* was established in 1755. Its establishment, part of Pombaline reforms, aimed to stimulate trade and development in the Grão-Pará and Maranhão region.
 - 6 The Pombaline Period, spanning from 1750 to 1777, corresponds to the time when Sebastião José de Carvalho e Melo, the Marquis of Pombal, served as Prime Minister of Portugal during the reign of King Joseph I. This era was marked by profound economic, administrative, and social reforms, heavily influenced by the Enlightenment ideas of the time.
 - 7 The initiatives included the establishment of the *Companhia de Cabo Verde e de Cacheu* (Cabo Verde and Cacheu Company) in 1680, followed by the creation, in 1682, of the *Companhia Negreira do Pará e Maranhão* (Pará and Maranhão Slave Trading Company,) which held the monopoly over the transatlantic slave trade. Additionally, the *Companhia de Comércio do Estado do Maranhão e Grão-Pará* (1667–1706), also monopolistic in nature, was created with the objective of stimulating transatlantic trade in both goods and human beings. However, the Company failed to fulfill its objective and further exacerbated tensions between the clergy and the colonists. The first trading company was unable to bring about significant changes in the structure of the colony (Diégues Júnior, 1750; Almeida, 2006; Viveiros, 1977; Carreira, 1988,) thus failing to fulfill the objectives for which it was created—namely, to promote the introduction of labor, ensure the supply of essential goods from the metropolis to the colony, and facilitate the export of the colony’s limited production. The number of enslaved Africans brought into the region by the Company did not exceed 500 per year—an amount insufficient to meet the demands of landowners (Lisboa, 1865; Prado, 1980; Furtado, 1982; Almeida, 2006.)
 - 8 The General Law of Indigenous Freedom enacted on June 6, 1755, as part of Pombal’s reforms, abolished the enslavement of Indigenous peoples. Initially, the legislation applied only to the state of Grão-Pará and Maranhão, and was extended to the rest of the colony only in 1758. In this sense, the law appears to have been enacted with the aim of serving the interests of Pombal’s protégés and undermining the religious orders, particularly the Society of Jesus.

With Pombal's rise to power, the colonial reality would change significantly, as he implemented a series of policies to support settlers, resulting in a substantial increase in the introduction of labor through a profitable trade based on the international trafficking of enslaved Africans. According to Costa (2018, p. 244,) this dynamic reshaped the peripheral provinces of Maranhão and Grão-Pará (Furtado, 1982; Prado, 1980; Lima, 1998; Mota; Barroso, 2017,) particularly with the establishment of the General Company of Trade of Grão-Pará and Maranhão.

The peak of the influx⁹ of enslaved Black people into the rest of Brazil began in the early years of the 18th century and persisted until the mid-19th century, even in the face of growing international pressure and measures imposed by other nations against the transatlantic trafficking of African bodies. The trade in enslaved Africans in the Grão-Pará and Maranhão region intensified significantly in the second half of the 18th century. According to Mota and Barroso (2017, p. 8,) between the years 1751 and 1787, approximately 22,414 enslaved Africans entered Maranhão, coming primarily from Upper Guinea, Cape Verde, Central West Africa, and São Tomé.

In the then province of Grão-Pará, the first enslaved Africans were introduced between the second half and the last quarter of the 17th century, and, as in Maranhão, the number of enslaved people progressively increased as certain measures were implemented by the metropolitan government. According to Salles (1971,) the Companhia Geral de Comércio do Grão-Pará e Maranhão was the main driver behind the introduction of enslaved Africans into Pará. According to data presented by scholars, over a period of 22 years, the Company transported nearly 15,000 enslaved individuals to the province, which definitively influenced the formation process and the ethnic composition of Amazonian society and the communities that would emerge within the forest interior. Salles (1971) also mentions another route through which enslaved individuals arrived in Grão-Pará, stemming from the internal trade of enslaved people coming mainly from Bahia and Mato Grosso, further increasing the contingent of enslaved individuals introduced into the Amazon region.

Thus, there was an accumulation in the introduction of a large volume of enslaved Africans, combining the influx resulting from the transatlantic slave trade with the subsequent dynamics related to the so-called Brazilian economic cycles (Prado, 1980; Furtado, 1982.) These contributed to

9 The introduction of the first enslaved Africans took place at the end of the 16th century and the beginning of the 17th century. As stated by Marquese (2006, p. 112,) between 1601 and 1625, approximately 150,000 enslaved Africans were introduced into Portuguese America.

a process of redistribution of enslaved individuals among the provinces—a phenomenon classified by scholars such as Marquese (2006) as internal slave trade. It is precisely this new scenario of internal slave trade that gains strength in the second half of the 19th century, reconfiguring the distribution of the enslaved population across the provinces.

With the formal abolition of slavery in the final quarter of the 19th century, formerly enslaved individuals were left to find their ‘place’ in society. This occurred primarily in three ways: those who had been inserted into urban and domestic contexts were pushed into informal labor and precarious housing settlements in the cities where they had lived; those already living in quilombos remained there; and those whose labor was still immobilized by the slaveholding regime, when not retained as dependents on former plantations—subject to labor conditions scarcely different from those of slavery—were forced to migrate and survive through informal work in urban areas. In very rare cases, with the bankruptcy and abandonment of estates by former slaveholders, some of the formerly enslaved remained on the former properties as squatters (*posseiros*.)

This scenario of abandonment of formerly enslaved individuals—whether by their former ‘masters’ or the ‘State’ (with the emerging Republic in 1889, just one year after the formal abolition of slavery in the country)—ultimately forced a large contingent of Black people to occupy urban areas through informal means. It is precisely this historical and social context that explains the current predominance of people in the Amazon who self-identify as Black¹⁰.

When we examine the official population data—namely, those resulting from the 2022 census conducted by the Brazilian Institute of Geography and Statistics (IBGE)—we find the following: first, that the percentage of the population self-identifying as Black surpasses 65% in each of the nine

10 It is worth noting that, according to the criteria used by the Brazilian Institute of Geography and Statistics (IBGE) for population counting, the number of people who self-identify as Black is calculated by combining those who identify as ‘pardo’ (mixed race) and those who identify as ‘preto’ (Black). This classification has, to some extent, been politicized by Black social movements in Brazil. In this sense, Brazil—and, by extension, the Legal Amazon region—has the largest population of individuals who self-identify as pardo, a racial category that emerged from a long history of ‘miscegenation,’ often involving various forms of violence, particularly sexual violence against Black and Indigenous women. This has been highlighted in a recent study on the formation of Brazilian society conducted by researchers at the University of São Paulo (USP) and published in *Science* in May of this year. See Escobar (2025). Link to the paper on *Science*: <https://www.science.org/doi/10.1126/science.adl3564>

states¹¹ that make up the Legal Amazon region. Adding up the population of these states, there are approximately 20 million people who self-identify as Black in the region. Of these people, approximately 79% reside in the urban areas of the Amazon region. In light of the official data, there is no doubt that we have sufficient evidence to assert that the Amazon is Black! However, interpretative frameworks that disconnect Black bodies from the notion of the Amazon—or from being recognized as Amazonian bodies—persist with considerable strength. This hegemonic way of thinking, representing, and interpreting the Amazon is thus constructed by rendering invisible more than 17 million people, denying them—and erasing—a whole set of cosmological and epistemological relationships with the territory. The historical silencing of the relationships that Blackness has with the Amazon is deliberate, creating the impression that Black people who live in and connect with the Amazon should remain excluded from decisions about the region's direction and future.

What is at stake are the power relations that grant some the authority to decide the future of the Amazon—even to dictate who can or cannot be considered Amazonian, or whose body is deemed to represent Amazonian ancestry. In this sense, thousands of Black people living in cities—whose ancestors settled there decades ago and who, in many cases, have turned some of these spaces into sacred places, such as those where *terreiros* were established to worship their ancestral deities, cared for by their priests—seem to be left out of the picture altogether, not even considered in discussions about the region. It is as if they simply did not exist, and their history with the Amazon were trapped in an ontological condition of non-existence. It is as if Black people had never inhabited the Amazon, and their bodies were ontologically denied the possibility of bearing an ancestral relationship with the Amazonian territory.

In other words, their bodies are not recognized as Amazonian, and in the current context, one of the main challenges these people face is to emerge from invisibility and thus gain recognition of the existence of a Black Amazon. This is only possible through political struggle, which entails an intense process of mobilization and the occupation of spaces of Amazonian debate—both about and within the region—by Black bodies. Moreover, beyond recognition, political mobilization is necessary to break—or even fracture—the interpretative frameworks, i.e. the bubbles where decisions about the Amazon are made.

11 The states that make up the Legal Amazon and their respective Black population contingents are: Acre 72.5%; Amapá 73.7%; Amazonas 73%; Maranhão 79%; Mato Grosso 65%; Pará 79.64%; Rondônia 68%; Roraima 72.6%; Tocantins 75%.

A QUILOMBOLA AMAZON RENDERED INVISIBLE

Throughout the nearly four centuries during which slavery persisted in the ‘Americas’¹², Africans brought as enslaved people to the so-called ‘New World’ engaged in a continuous process of resistance against this condition. Resistance to slavery in the American continent took various forms, such as suicide, refusal to obey orders, infanticide, and rebellion, among other ways of resisting enslavement. The act of resisting provided the necessary conditions for the enslaved to reclaim their freedom and human dignity through the formation of free, economically autonomous, and viable communities, which they called quilombos¹³. The Amazon region, along with the Northeast, will be the two regions in Brazil with the highest prevalence of these Black institutions that emerged in the context of slavery (Bastos, 1866; Magalhães, 1876.)

In this way, the social organizations of resistance to enslavement founded by different Black peoples in the ‘Americas’ primarily enabled Black individuals to develop alternative forms of society in opposition to a social system in which Black people were regarded merely as ‘disposable cogs’ in the machinery of slavery. Although these institutions did not constitute a unified political project for the liberation of Black people in the ‘Americas’ during the period of slavery, this does not mean that these initiatives cannot be understood as Black political liberation projects.

In this case, the quilombo institution can be understood as the main symbol of resistance to slavery and as a space of freedom for the enslaved. It is worth noting that the quilombo was a constant phenomenon throughout the duration of the slavery regime in Brazil. Thus, wherever there was slavery, there was quilombo¹⁴ (Moura, 1988)—the form of Black social or-

12 The terms ‘New World’ and ‘Americas’ appear in quotation marks to highlight that they are colonial inventions, part of a framework constructed by European colonial structures of domination, which, among other actions, arrogated to themselves the right to rename and destroy places, bodies, cultures, sacred rituals, and to perpetrate violence etc.

13 The analysis I intend to make here about the quilombo institution—or rather, the story I will tell about the quilombos—will not follow the perspective consecrated by the scholarly common sense of positivist historiography, which views the quilombo in a stereotyped and criminalized manner. The perspective I bring on what was the main instrument of Black resistance to slavery is an interpretation based on authors who view this institution as capable of shaking the foundations of the slaveholding society.

14 The definition of quilombo, which has been upheld even by the learned common sense, is that of a place sheltering Black people who escaped from large estates or plantations—as understood in the sense proposed by Mintz (1951)—during the slaveholding regime in Brazil, where they established settlements in remote locations. Moreover, official historiography reproduced the police-like designation of quilombo from the Portuguese Overseas Council of 1740, which regarded quilombos solely in a criminalized manner and as isolated entities.

ganization that most contributed to undermining the slavery regime in Brazil. By coexisting with colonial society, the quilombo held vital social importance in balancing the relations between the two main “social classes” of the slaveholding society: for the enslaved, it nurtured the hope of achieving freedom, reclaiming their humanity, and reimagining the idea of community (Anderson, 2008.) For the slaveholding class, on the other hand, it gradually became a nightmare, given the quilombos’ potential to destabilize the colonial system.

In the Amazon, the organization of quilombos acquired specific characteristics, becoming a possibility for the enslaved and other marginalized groups, such as Indigenous peoples¹⁵ (Moura, 1988), to experience the reconstruction of life in a new social, economic, and political context. However, it is important to highlight that, in some cases, these territories are the product of the enslaved people’s process of reimagining how to use the means of production and natural resources they were abandoned with, as well as the relationships built with other equally marginalized bodies with whom they had to converge in order to survive within the context of the diaspora.

Bastos (1866,) Magalhães (1876,) Montello (1975,) and Farias Júnior (2017) point out the quilombolas took advantage of the natural conditions offered by the Amazonian river system and established important fluvial trade routes. By using the main rivers of the Amazon, along which they settled—mainly in what today comprises the states of Pará, Amazonas, and Maranhão—they boosted the internal market and consolidated commercial and social relations. In fact, the productive autonomy of the

15 I am not suggesting a relationship along the lines proposed by Goldman (2014) and Anderson (2007). What I am stating is that the process of solidarity and alliances between groups such as Indigenous peoples and quilombolas in the Amazon is historical, as highlighted by specialized literature, but that this did not massively converge into the formation of a movement or ethnic communities that identify themselves as Afro-Indigenous. Most of the time, where such convergence occurred, as in the case of Alcântara, the members of the groups politically chose to self-identify as either Indigenous or quilombola, maintaining clear ethnic boundaries (Barth, 1969.) In this sense, there has been no ‘ethnographic situation,’ at least in the Brazilian Amazon, where groups claim, identify with, or self-define by a dual identity, although theoretically this is possible, according to Hall (2003.) However, it is very common in the Amazon to find kinship ties between Indigenous peoples and quilombolas, whether by blood or social kinship, as is the case with the relationships between quilombolas and the Kahyana Indigenous people in Cachoeira Porteira, Pará.

quilombos and the variety of crops cultivated in their *roças*¹⁶ enabled the quilombolas to foster the emergence of an internal market through establishments and networks of trade with small merchants from Amazonian villages who were not served by the plantation economy logic (Bastos, 1866; Magalhães, 1876; Montello, 1975,) thus invalidating the theoretical interpretation that quilombolas lived in isolation.

The quilombo can be understood as a 'revolutionary' form of land appropriation in the Amazon, the first experience of land access for non-white people through means other than the 'official' ones¹⁷. In this sense, the formation of quilombos challenges the main source of power of the colonial elite: land.

Settling on a piece of land had such an extraordinary meaning for the enslaved that it was necessary to rename everything, including the way they referred to the spaces they came to occupy. In other words, the quilombo not only redefines the way of accessing land but also the very idea of property itself, because by subverting the colonial land order, it also overturns the notion of private property by establishing the concept of collective ownership, along with other forms of natural resource use that differ from the mode of production of colonial society.

Unlike colonial society, whose economy depended on the combination of large estates with the exploitation of enslaved labor focused on monoculture to fulfill the colonial pact with the great European metropolises, the quilombo is based on the common use of land and natural resources and on free, collective family labor. Since they were not bound by the colonial pact, the quilombolas had a unique condition in Brazil: besides maintaining collective control over the means of production and owning their labor force (Bastos, 1866; Magalhães, 1876; Montello, 1974; Farias Júnior, 2017,) they directly controlled the commercialization and circulation of their products.

16 The *roças* are cultivation areas used by residents of quilombo communities and are fundamental to these communities, as they form the basis for organizing the entire food production chain. With variable size, depending on the family size or family planning for a given year, for a long time the *roças* constituted the main source of income for quilombo communities.

17 The quilombo enables access to land for a portion of the population whose very humanity is not even recognized, since Black people are perceived by the colonial elite as 'objects.' If previously access to land ownership in Brazil was granted through a royal concession by the Portuguese crown, after the country's independence in 1822, such permission became the responsibility of the emperor. However, the rules for land distribution did not apply to Black people, but only to white men with political and social influence with the Portuguese crown or the emperor.

Furthermore, it is important to emphasize that the relationships Black people established with the Amazon are not merely economic or commercial, but ancestral—a connection built through the quilombos, which, as previously stated, came to be configured as a space for reimagining the idea of community, the reconstruction of family, identity, affections, the recovery of humanity, and above all, a space of collective existence. All this stands in stark contrast to the violence of the colonizers, whose main strategy was to destroy any affective bonds among the enslaved to facilitate domination and objectification, and to hinder the creation of collective solidarity ties among the captives.

The relationships established in the Amazonian quilombos can be theoretically understood through Gilroy's (2001) ideas and the processes that led to cultural flows and interactions between Africa and the West, stemming from the forced diaspora of Africans during the transatlantic trade. This is framed by the contrapuntal perspectives proposed by Spillers (2003) and Tinsley (2008,) who argue that the 'slave ships' did not bring only enslaved Black people, but that these bodies also carried to the "Americas" a whole set of ancestral cosmologies and epistemologies, through which Black people were able to redefine their experiences within the context of colonial violence in the diaspora.

It is precisely on the basis of this ancestral cosmological, ontological, and epistemological framework—carried by the Black bodies subjected to the forced diaspora—that Black people, especially those who settled in quilombos, were able to forge ancestral connections with the Amazon rainforest. In doing so, they made it possible to root their ancestry in the ways available on this side of the Atlantic.

QUILOMBOLA COMMUNITIES, THEIR ANCESTRAL RELATIONSHIPS WITH NATURE, AND NEW POSSIBILITIES

With the end of the period of enslavement, quilombos were rendered invisible, just like the Black population as a whole. The reorganization of elite interests led to a transition in both the country's prevailing mode of production and its political regime. The first shifted from institutionalized slave labor to wage labor, which also involved the replacement of Black labor with immigrant workers of European descent.

This transition process led to the replacement of the monarchy with a republic and a shift in Brazil's labor regime; what remained unchanged, however, was the exclusion and erasure of the lived experiences of Black people—both those in urban areas and those in rural communities who

nurtured their ancestral connections with nature—who remained invisible from the final quarter of the 19th century until the end of the 20th century¹⁸.

It was only in the mid-1980s, with the political re-democratization and the new constituent assembly, that mobilizing political processes emerged, led by Black movements from Maranhão and Pará. In coordination with Black constituent congresspeople affiliated with the Unified Black Movement (*Movimento Negro Unificado*), these efforts led to the recognition of quilombola territorial rights through the inclusion of Article 68 in the Transitional Constitutional Provisions of the Brazilian Constitution. Almeida (1996) argues that the processes of identity construction, in the case of rural quilombola communities, were based on political mobilizations and struggles, as well as the redefinition of symbols and political-organizational criteria. This will imply, in the case of Black communities, a convergence toward an identity politics around the quilombo category, a form of representation of collective existence.

The legal recognition of quilombola rights could be the key to resolving land disputes involving territories, natural resources, and the very condition of existence of these groups, including their physical, social, religious, and cultural reproduction. However, such effects were not immediately achieved because these rights were neither implemented quickly nor efficiently. Thus, we perceive that bureaucracy and state racism have been obstacles to the realization of quilombola territorial rights.

In other words, without the enforcement of these rights, there is a risk of repeating a cycle of denial of citizenship to quilombolas, just as occurred in colonial society. The ethnographies produced by quilombola researchers in their own territories — Pereira Junior (2012;) Ayres (2015;) Lopes (2015;) Santos (2015) — describe the notion of territory as rooted in symbolic definitions based upon it. These ethnographies also problematize the limitations of Western territorial designations, which have obscured the pluriversal and symbolic conceptions of quilombola territory.

Instead, these ethnographies show that territorialities emerge from the symbolic universe of what Almeida (2006) designated as specific territorialities. The territorial interpretation from the quilombola researcher's perspective reflects their social world. In this sense, the material and

18 After the end of the First Republic (1889–1930,) Brazilian elites repeatedly reorganized and repositioned themselves. Each time the elites reorganized, political crises and regime changes followed — as seen with the Provisional Government (1930–1934) and the Constitutional Government (1934–1937,) which came after the 1930 Revolution, followed by the Estado Novo (1937–1945), the Populist Republic (1945–1964), the military dictatorship (1964–1985,) and finally the New Republic.

symbolic existence of the territory is grounded in the set of collective symbolic relationships ancestrally shared among the community members, which have been disregarded by Western notions of territory.

Moreover, quilombola territories differ from the notion of territory held by the nation-state, where territory can be easily objectified in cartographic form, in maps characterized by fixed borders and clearly defined polygonal perimeters. Quilombola territories, on the other hand, are defined by ancestral relationships and connections that are not documented as prescribed by Western tradition, and sometimes cannot even be described (Mignolo, 2017; Smith, 2018.) The problem of understanding what territory is cannot be approached from the way it is constructed by the nation-state; here, territory relates to the network of relationships and the space where ancestry, cosmology, and epistemology are reproduced and transmitted through internal relations and the various forms of sociability employed by the communities. These do not necessarily require fixed boundaries, nor do they conform to geometric shapes or can be encapsulated by them, as they exist more specifically on a symbolic plane.

In this sense, the ancestral relationship of quilombolas with the Amazon cannot be questioned, since, even before existing in the diasporic context, there was already an ancestral connection with the forests. It is this ancestral connection with the forest and its biodiversity that drives the quilombolas to mobilize politically and spiritually to sustain a collective existence and preserve the environment.

In this sense, the political actions undertaken by quilombolas in defense of the Amazonian territories can perfectly be understood as part of a Black radical tradition, as defined by Robson¹⁹ (1983,) which is experienced through the relationships built over time between the quilombolas and the forest. It is deeply embedded in the collective consciousness that their existence and that of their territories is only possible because it is collective. In other words, quilombolas cannot exist outside the ancestral relationships between their bodies and their territories.

This radical tradition of quilombola communities in defending their territories and the Amazon rainforest is rooted in emancipatory ecological practices that involve the preservation of both the human and the non-human (Ferdinand, 2022.) However, they increasingly face more difficult challenges in confronting their antagonists.

19 According to Robson (1983, p. 171,) the Black Radical Tradition is a perspective in which Black societies in the Americas continued to develop collective consciousness, informed by the historical struggle for liberation and motivated by a shared sense of duty to preserve collective existence and ontological wholeness.

Quilombola communities with territories located in the Amazon not only face the challenge of fighting for their ecological practices of forest protection and their relationships with nature to be recognized as part of the good practices of forest peoples—who have contributed to preventing the world from reaching the climate crisis point of no return—but also contend with the historical disassociation of their bodies from climate protection narratives. Despite historically suffering the effects of climate racism²⁰—especially by being excluded from environmental discussions and decision-making processes—they are among those most at risk from the impacts of the climate crisis. This is true even though their daily ecological practices run counter to those that fuel and intensify ecological collapse.

The struggle of the quilombolas in the Amazon is still for the recognition not of their identity as quilombolas, but of their ancestral science and technology, which for years have been used both for the rational use of available resources and for the development of ways of relating to nature—and, through it, influencing daily practices in order to protect the environment with which they are connected, such as the Amazon.

It is a struggle, in a certain sense, to demonstrate to the West that quilombola bodies are bearers of science—science that is practiced daily in their territories, rooted in the life of the community. It is through this science—often labeled as ‘traditional knowledge’—that they draw from plants their full healing power. Even in their economic practices and labor-related knowledge—such as deep-sea fishing or navigating the vast Amazonian rivers, or even moving through the forest—the quilombolas have always drawn upon their sophisticated knowledge of astronomy. This allows them to travel anywhere without losing their way home, guided only by the sky and the constellations.

In the field of agriculture, the knowledge carried by quilombola bodies enables them to understand and navigate phenomena such as rainfall and drought patterns, to identify the best places and times for planting, and, moreover, to determine what to plant in each location.

It is such a powerful ancestral connection that a quilombola only needs to ‘cast an eye’ to know the best place to find drinking water. It is a type of knowledge or science that carries ancestral technology and its own epistemology, but what is most striking about this kind of science and technology, rooted in ancestral epistemic traditions and practiced daily as ecological practices by quilombolas in their territories, is the absence

20 Definition related to marginalized groups who are more exposed to the risks and consequences of the climate crisis, and who are less heard and involved in environmental policy decisions.

of conflict with nature. Even though it is something so fundamental and important for the preservation of the planet and contributes to the preservation of life on Earth, many of us are unable to perceive or appreciate it.

Obviously, we live in a world where traditional peoples and communities, such as quilombolas, are engaged in a very difficult struggle to maintain their ancestral forms of territorial development, which have made it possible to protect and preserve the natural resources available in their territories and the entire surrounding forest. Nevertheless, this form of community development is often overlooked in debates and decision-making forums regarding the Amazon.

It is certain that we live in a world that offers little room for our own forms of development, technology, and science — those rooted in our relationships with nature. Our voices are not heard. The racism that mediates these relationships dehumanizes us and denies our ability to produce science and technology, as this is seen as a task reserved for white bodies.

There is a violent and racist logic that attempts to place the blame for Brazil's so-called scientific and especially economic 'backwardness' on traditional peoples who protect the Amazon and other biomes in the country. Its strategy is to deliberately incite 'public opinion' against forest defenders, encouraging the general public to view forest peoples as an obstacle to the market economy — more precisely, the commodity market economy.

It seems that the West is trapped in a straitjacket that forces it to conceive of technology, epistemology, and development from a single perspective — one that clashes with the traditional Amazonian ways of experiencing development, technology, epistemology, and science through radical ancestral ecological practices. From the perspective of quilombola communities and traditional peoples of the Amazon — based on their lived experiences, ways of life, modes of existence, and relationships with their territory and environment — there is no technology more advanced or efficient than nature itself.

Quilombola communities are now facing another kind of objectification — one imposed, unsurprisingly, by capital. It is worth remembering that the enslaved Black people who formed the Quilombo did so precisely because this place, this institution, allowed them to escape the objectification of their bodies. The struggle they now face is not only to resist the objectification of their bodies, but also to prevent their territories from being objectified — a fight for the right to ancestral existence.

The greatest threats to the environments of quilombola communities stem from the Western model of development, which turns forests, natural resources, epistemologies, cosmologies, affectivities, ancestries,

ontologies, spiritualities, territories, and bodies into commodities to be placed on the market — that is, reducing an entire epistemic-ontological framework into something that can be commercialized. The offensive by corporations against the territorial rights of quilombola communities and traditional peoples and communities in general has provoked territorialization, genocides, epistemicides, and all kinds of violence and rights violations against quilombola bodies.

What we currently see in Brazil, especially from agribusiness and its supporters, is an attempt to relax environmental protection laws. To achieve this goal, corporations and agribusiness have used the strategy of mobilizing their caucus in the National Congress, along with their allies, to propose bills (PLs) and/or constitutional amendment proposals (PECs.) The challenge currently facing quilombola territories, as well as traditional peoples and communities in general is Bill 2159, which aims to relax environmental licensing requirements. This Bill was approved by the Senate in May of this year, under the argument of simplifying processes, which, according to proponents of a development logic based on dangerous and simplistic ideas that perceive natural resources as inexhaustible and therefore subject to exploitation, this is justified in the name of a supposed economic and social benefit that allegedly will benefit all of humanity. Furthermore, they portray the social groups who have been fighting to preserve their territories in the face of the advances of so-called mega-projects as hindrances to the country's development.

This development logic expressed in Bill 2159 does not align with the ways of existence and lifestyles of traditional peoples and communities. In this sense, it represents a double loss for these peoples and communities because it puts their territories, or their specific territorialities, at risk while also excluding them from the economic benefits of such policies.

In summary, if approved by Congress and signed into law by the President of the Republic, Bill 2159 will guarantee that both the state and private enterprises interested in promoting so-called mega-projects — including agricultural, mining, and hydroelectric ventures, as well as other large infrastructure projects, which have been major bets of both left- and right-wing governments driven by pure developmentalism rather than by the protection of the rights of future generations — will be allowed to proceed with any type of project without having to comply with any environmental protection or prevention requirements. In other words, it would be a *carte blanche* for environmentally weak projects to multiply across the country, threatening territories of quilombola and traditional peoples, without holding anyone accountable for the tragedies or disasters that may result from the implementation of these projects.

Bill 2159, ultimately, is denialist because it denies the effects of climate change, reinforces the concept of environmental racism, and violates constitutional rights as well as infra-constitutional provisions to which Brazil is a signatory, such as Convention 69 of the International Labor Organization, which guarantees the right to free, prior, and informed consultation for any type of undertaking to be carried out on the territories of Indigenous peoples and traditional communities. Therefore, as currently drafted, Bill 2159 has a clear objective: to deny the right to consultation to Indigenous peoples, quilombola communities, riverine populations, babassu coconut breakers, and other groups that make up the collective of Amazonian peoples or traditional peoples of Brazil. For example, it guarantees that undertakings such as the construction of roads can be carried out on the territories of Indigenous peoples and traditional communities without these communities having the right to be consulted.

In other words, the bill removes autonomy and fundamental rights guaranteed by the Constitution, as well as other rights won through the struggles of these communities to protect their territories. More than that, it puts at risk the disappearance of peoples, their territories, their way of being, and their cosmopolitics. It also puts at risk forests and natural resources because, as already mentioned, when a territory is officially recognized as belonging to any traditional people or community, it constitutes the most efficient and effective environmental protection policy. It should not be forgotten that any environmental intervention, as proposed by Bill 2159, also reflects an intervention in the symbolic world of traditional peoples and communities, putting at risk an entire set of ancestral epistemologies.

Even in the face of this challenging scenario, traditional communities such as the quilombolas continue to engage in a determined struggle against the effects of the climate crisis and global warming — transformations on a planetary scale, driven mainly by Western models of technological and financial development. This struggle takes shape primarily through radical ecological practices and the fight for the legal recognition of their territories. When a territory inhabited by a quilombola community is granted legal title, it is not only the quilombolas who benefit — all of humanity does. This is because the presence of the community within the territory should be understood as a way of protecting the forest and its biodiversity. It is also a way of protecting humanity from the effects of the climate crisis and global warming.

Western science affirms the territories of traditional peoples and communities are the most well-preserved. In a way, these territories are becoming the last refuge for both Amazonian and global biodiversity, and they represent one of the few remaining hopes for a solution to the climate

crisis humanity is facing. Even so, in decision-making spaces regarding the future of the forests — and specifically the Amazon — the bodies invested with the power to make decisions, unfortunately, are not Amazonian bodies; and in the rare exceptions, they are white Amazonian bodies.

One of the ways forward for humanity in facing the climate crisis and global warming lies precisely in placing as much forest as possible under the care of its peoples — even as a means of ensuring environmental and climate justice. In this sense, ensuring land ownership for forest peoples means ensuring environmental and climate justice. However, it is necessary to go further and expand the mechanisms for land titling for traditional peoples and communities as a means to protect the forest and its biodiversity. It is essential to make the land titling of Quilombola and Indigenous peoples' territories part of public climate financing policy. The Brazilian State must recognize that an effective and socially responsible climate policy requires the formal recognition and titling of the territories of traditional peoples and communities. This should be a commitment undertaken by the Brazilian State as part of its climate public policy in the Nationally Determined Contributions (NDCs) submitted for COP30 — the Climate COP — which, for the first time, will be held this year in the Amazon region.

Western society must understand that the forest and nature are sacred to traditional peoples and communities, and that these peoples have made enormous efforts to keep parts of the forests and their biodiversity protected—often sacrificing their own lives, as many leaders from traditional peoples and communities of the Amazon have lost their lives in the struggle to protect the forest. No! There is nothing more sacred than life — life understood here in the sense of nature itself, of the forest itself. We cannot sacrifice what is most sacred for us anymore!

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TELLING STORIES TO CHILDREN AND TEENAGERS: “RECONSTRUCT(BE)ING” FROM FRANS KRAJCBERG’S LIFE STORY

Uillian Trindade Oliveira¹

ABSTRACT

This text reports and analyzes the impact of storytelling and artistic expression through drawing in the classroom, focusing on the life and work of Polish artist Frans Krajcberg (1921–2017). After listening to and exploring Krajcberg’s biography, students were invited to produce drawings, stimulating reflection on the environment and creative expression. In this text, I discuss the concepts of storytelling, children’s drawing and Life Story, based on the theoretical intercessors: Abramovich (1997); Vygotsky (1998); Haguette (1990); Rosa Iavelberg (2021); Meirelles (2024) and Oliveira (2015). Among the results, the experience demonstrated the relevance of these pedagogical approaches: storytelling and drawing in order to foster critical thinking, engagement with socio-environmental issues and the development of creativity in students.

Keywords: Storytelling. Frans Krajcberg. Drawing. Art. Education.

INTRODUCTION

It was the beginning of the 2015 school year at EEEFM Antônio Engrácio da Silva, located in the Feu Rosa neighborhood, in the municipality of Serra, Espírito Santo. I worked as an Art teacher. When the principal, Ledimar Ramos, told me that there was a budget of 5,000 reais for the production of a book and that there was no interest from the teachers, she asked me if I could produce a book with the students. Together with my intern, Rosalba Reis Amaral, I decided to take on the challenge of producing Frans Krajcberg’s story for/with/by children. Thus, I also invited the Portuguese Language teacher Gilmara Teixeira Rosa Elias and her intern Márcio Baptista to work on poems from each decade of Krajcberg’s life. It was the beginning of a great artistic, literary and poetic journey. Therefore, in this text, I seek to report and unveil the imaginary of children and adolescents in representations of drawings and poems using oral history. This is an account of the experiences, childhood and violence present in the life story of Frans Krajcberg, whom I sometimes affectionately refer to as Kraj, which was how he liked to be called.

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This article aims to report on an experience of creating drawings based on the telling of a life story. It was developed with 250 students, from 6th to 9th grade, aged between 10 and 15 years old. The artist lived to be 94 years old, so his life was divided into eight parts, and each class was tasked with drawing and writing poetry about one decade of Kraj's life, for a total of eight groups.

At the time, I was finishing my dissertation on the artist's life and knew how to tell his story, having known him since childhood, because my father had been his personal friend since the 1970s, but also because I had already done academic research on him. Thus, the following topics were established for each class: 1 - World War II; 2 - Arrival in Brazil, early days; 3 - Living in Paraná; 4 - Living in the forest; 5 - Krajcberg producing his sculptures; 6 - The photographer of the fires; 7 - Life in Nova Viçosa and the "tree house"; 8 - Krajcberg: defender of life through art.

The stories told are based on my doctoral dissertation, in which I narrate the life trajectory and artistic creation process of the environmentalist and artist Frans Krajcberg, whose aim is to value and reconstruct the being, things and objects that are part of everyday life. This was also the aim of the book produced at the school.

It is important to clarify that the stories I told my elementary school students, which make up my dissertation and this text, are the result of what Kraj told me during his lifetime, the stories my father recounted, and the books, videos, and newspaper articles I had access to. On several occasions, the stories he told seemed ambiguous and fantastical, but I always respected them because of his advanced age and the effort he made to reconstruct his life story. Regardless of what has been told to me, real stories filled with heroism and panache, Krajcberg is an influential figure both in contemporary art worldwide and in the defense of biodiversity. In this sense, Meirelles (2024) states:

Zé do Mato repeated it to me on several occasions: "He is a mystery. He always falls into ambiguity...". Ricardo Ribenboim had warned me about the danger of biographies being fictional, as everything happened perfectly there. Similarly, Jaime Cupertino had also warned me that Frans' memory had been constructed by him (Meirelles, 2024, p. 310).

Frans Krajcberg was a brave man, persistent and passionate about life in nature. Through his art, he has drawn attention to the damage that nature has suffered over the last five decades. This story begins with happy moments of Krajcberg living with his family in Poland, followed by war, destruction, death and loneliness, until he came to Brazil and found hope in nature to restore his life. With a focus on Krajcberg's life story,

the students brought the artist's experiences into their world and told his story through their drawings and poetic texts.

THE IMPORTANCE OF STORYTELLING FOR CHILDREN AND TEENAGERS.

In my classes, I have always introduced the content by telling stories. It is well known that storytelling is a highly relevant method in supporting teaching strategies used by teachers. The practice of storytelling is a language intrinsically aligned with literature, orality, and traditional cultural expressions, which, when intertwined with the educational environment, transcend mere instrumentality, becoming a complex cultural practice. This practice has a purpose, representing the act of sharing narratives, life stories, characters, and events, whether real or imaginary.

When I gathered the students to tell them about Kraj's life, I could see in their eyes that they were on an emotional journey. It is through culture and through its lens that we conceive and symbolize the world, inscribing our creative mark upon it and building it upon symbolic foundations. Culture is the vector of our invention of the world, and it is through culture and its unique perspective that we interpret reality and unravel the mysteries that permeate its essence. In this context, drawing a parallel with the past, Tettamanzy (2008) argues that memory, in traditional societies, was revered as the only effective means of preserving and perpetuating knowledge for future generations. The act of telling stories establishes a connection with that time when human beings depended exclusively on their mnemonic capacity and their experiences, recovering attributes that are indispensable to the development and transmission of human knowledge.

According to Vygotsky (1998), this practice, conceived as a relevant pedagogical strategy, contributes to the improvement of teaching and learning of school content, as well as to the training of future readers. Through the fascination and enchantment inherent in storytelling, students are actively engaged, which in turn promotes the development of essential cognitive skills such as abstraction, focus, memory, and the ability to establish analogies and differences.

Telling stories about Krajcberg's life and artistic production transported children and teenagers to Krajcberg's time and space. There, each one interacted with their imagination and creative ability. Thus, Abramovich (1989) says that telling stories to children is to reach their emotional and cognitive essence in perfect harmony with the limits of their understanding and the depth of their affective capacity, as they incorporate elements that captivate them, stimulate their curiosity and fuel their interest.

DRAWING AS A PEDAGOGICAL ELEMENT

The pedagogical relevance of drawing in the school development of children and adolescents is widely recognized by key education theorists. Iavelberg (2021) highlights drawing as a tool that integrates different skills in the construction of knowledge. In this vein, the author emphasizes that drawing is more than just an artistic activity; it is a process that integrates diverse knowledge and experiences, enabling the construction of knowledge. In this context, drawing acts as a bridge between the child's inner world and the universe around them, providing opportunities for exploration and expression. Therefore, it can be used as an educational tool to integrate subjects, develop critical thinking, creativity and fine motor skills.

According to Iavelberg (2021), drawing is a meaningful artistic language in education, developed through personal work, which can be guided by teachers in art classes. This creative process is enriched when students choose their own path, based on concepts and values linked to the social production of art. Teachers play a crucial role in this guidance, balancing technical teaching with encouraging the creativity of the students, especially when the drawing is based on a narrated story.

I noticed that when I was guiding the groups that were going to make the drawings, the students drew and looked at their classmates' drawings. In this context, Iavelberg (2021) reports that the practice of drawing at school, based on the free choice of themes and techniques, is an important catalyst for students' interest and satisfaction with the subject of Art, fostering their artistic and aesthetic development. Education through drawing should prioritize training that promotes cultural participation in society and the development of imagination and creativity, fueled by various sources of information, such as cultural institutions, exhibitions, books, street art and storytelling.

Corroborating Iavelberg (2021), listening to stories encourages students to choose their own themes for their drawings, whether through imagination, memory, observation, or teacher guidance. This approach integrates art education and promotes students' creative autonomy, allowing them to develop their artistic projects based on the association between knowledge and creation, reframing their experiences and values through this artistic journey.

KRAJCBERG'S LIFE STORY DRAWN AND POETICIZED.

Corroborating Oliveira (2015), people with extraordinary and innovative lives present themselves as indispensable references, serving as inspiration to be observed and, eventually, followed. From this perspective,

the relevance of Krajcberg's life trajectory is unique, as it transcends courage and resistance to highlight resilience as a central element in understanding his artistic poetics. This resilience was remarkably evident in overcoming the adversities imposed by World War II, a period marked by traumatic ruptures in relationships with family members, culminating in the loss of loved ones in concentration camps. Despite such deep scars, Krajcberg undertook the effort to rebuild his life. When he emigrated to Brazil, he found in nature a renewed sense of purpose to start over, and this fruitful encounter was intensified by the symbiosis between art, always inherent to his essence, and the new territory, both in its geographical and cultural aspects, as Carino argues:

[...] It is the fact that the lives of the biographees themselves both assimilate and resist paradigms, which can be translated into society's expectations of their behavior. In this way, a life lived in an "iconoclastic" manner — in relation to established paradigmatic rules — gains biographical interest. Lives lived in the dullness of routine are not biographable. From the point of view of educational instrumentality, these "remarkable", "different" lives are decisive: they are what will make it possible to construct "revolutionary" models of conduct (to use Kuhn's terminology) in the face of the models established by the current paradigm. On the other hand, lives can be equally important in defending the established paradigm, which means that they are also valuable as educational instruments, to resist an educational model, when this, contradicting the transformative essence of education, its capacity to provide shelter for the renewal represented by the new beings that enter the world, becomes conservative, traditionalist and resistant to changes and innovations (Carino, 1999, p. 159).

Continuing with Oliveira (2015), during the dissertation writing process, I sought to preserve, as much as possible, the peculiarities of the object of study. In conducting the biographical survey, the search for images, objects, and interviews related to Krajcberg inaugurated a dynamic dialogue between past and present. This shift occurred because, as a researcher, I followed paths that were not originally familiar to me. In addition, I used the methodology of oral history, supported by the conviction that this approach could enrich the research undertaken. Thus, in addition to interviews with Krajcberg himself, I consulted individuals from his inner circle, such as collaborators, friends, and even my own father, in search of revealing details from the interpersonal relationships these figures had with the artist.

The life history methodological approach used in this research reveals the possibility of incorporating new variables, broadening questions and redefining parameters, promoting a reordering of the perspectives employed in an investigation. Furthermore, as explained by Haguette (1990), this method has the particularity of offering a procedural understanding, based on careful observation and the search for an empathetic and respectful connection with the other person's trajectory. This approach allows subtle aspects and relevant considerations to be analyzed and presented in a rigorously academic manner.

According to Moita (2007), life stories acquire their uniqueness as the investigative process develops. In recounting his life story, mobilizing memories and energy to reconstruct events, Kraj reaffirms his identity and simultaneously transforms himself, establishing a dialogical relationship with the researcher. In this sense, by articulating the dimensions of Krajcberg's life and work with the personal relationship that my family and I had with the artist, I realize that life stories are a powerful tool for understanding others in their entirety—from their choices and paths to their concerns, frustrations, and aspirations. From this perspective, it becomes possible to reveal unique forms of existence, valuing and respecting individuals in their interaction with the environment and in their relationships.

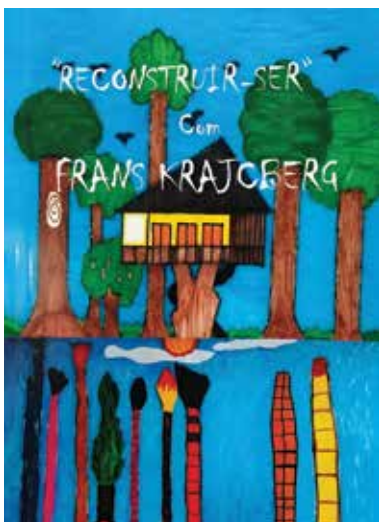
Haguette (1990) highlights crucial aspects that make life stories a valuable documentary source. Firstly, this method makes it possible to establish a reference for the analysis of documentary records related to an existential path of an individual. Secondly, it contributes significantly to areas of study that often approach it in a peripheral or superficial manner, offering foundations that favor the formulation of more concrete and well-founded inferences and conclusions, in which phenomena emerge with a greater degree of precision and reliability. Thirdly, it highlights that life history plays a strategic role, by providing suggestions and insights, especially in the context of research marked by subjectivity, directing the understanding of institutional processes often constructed based on unverified conjectures.

Finally, Haguette (1990) highlights a fourth fundamental aspect: life history, given its ability to explore details often ignored by other methodological strategies, proves to be particularly pertinent in contexts in which a field of study faces a shortage of data for analysis, either due to the exhaustion of new variables or the inability to generate new perspectives of knowledge. From this perspective, life history can act as a powerful instrument, bringing to light new elements, profound questions and parameters capable of reformulating investigative approaches, expanding the horizons of scientific research. In this context,

[...] the Life History method is a scientific method with all the strength, validity and credibility of any other method, especially because it reveals that no matter how individual a story is, it is always still collective, also showing how generic the trajectory of the human being is (Silva et al., 2007, p. 34).

From figure 1 to figure 9, I present some of the drawings from the book². The drawings are not signed by the students, as each class produced several drawings and the students themselves chose the ones that would be included in the book. Thus, each drawing and poem received credit from all students in the class. In January 2016, I travelled to Paris and delivered the book to Kraj in person at his studio in the Montparnasse neighbourhood, a moment captured in figure 9.

Figure 1. Cover of the book *Reconstruir-ser* [Reconstruct(Be)ing].



Source: author's collection, 2015..

Figure 2. Krajcberg in World War II, 1939



Source: author's collection, 2015.

² The book *Reconstruir-ser* (Reconstruct(Be)ing) was printed in a printing house and distributed to students at the school without formal publishing details such as an ISBN or index card.

Figure 3. Drawing by students representing Krajcberg being helped by Marc Chagall and embarking for Brazil with his fiancée of convenience.



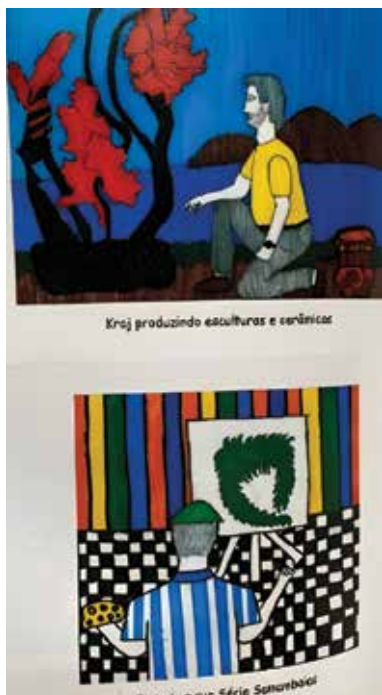
Source: author's collection, 2015.

Figure 4. Drawing by students representing Krajcberg producing his works.



Source: author's collection, 2015.

Figure 5. Drawings by students representing the production of his works.



Source: author's collection, 2015

Figure 6. Drawing by students depicting Krajcberg receiving the award for best painter in 1957 from President Juscelino Kubitschek.



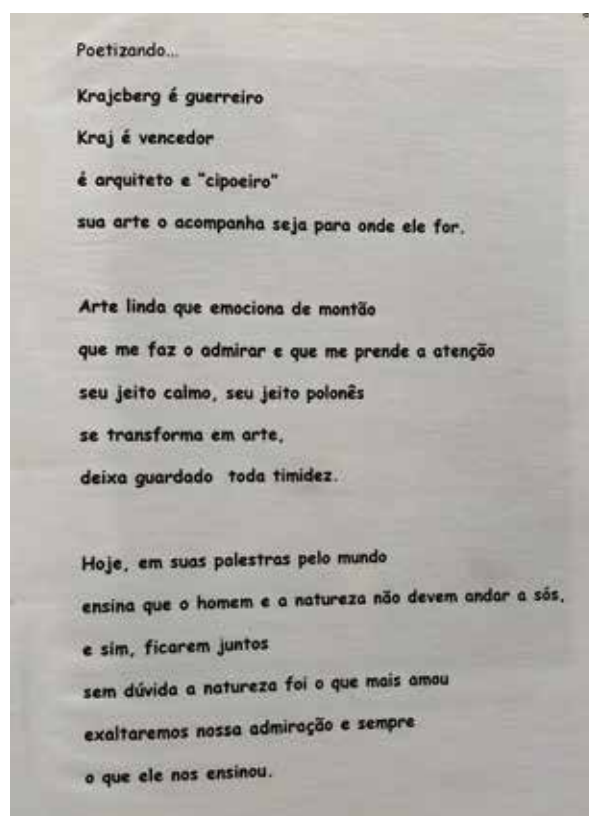
Source: author's collection, 2015

Figure 7. Drawing by students representing Krajcberg reflecting on life on the planet.



Source: author's collection, 2015

Figure 8. Poem written by students about Krajcberg's poetry.



Source: author's collection, 2015

Figure 9. Uillian Trindade Oliveira delivers the book produced with the students to Krajcberg in Paris.



Source: author's collection, 2016.

FINAL CONSIDERATIONS

Given the experience presented and the drawings developed, I conclude that the transformative impact of Frans Krajcberg's life story on the students was notable, as it promoted the development of graphic skills and environmental awareness. The experience of drawing and poetizing each decade of the artist's life inspired students to value the preservation of nature, in addition to learning about his important artistic poetics. This demonstrates the relevance of innovative pedagogical paths that combine art, narrative, literature and environmental awareness. This approach highlights the fundamental role of education in inspiring significant changes in new generations.

The life storytelling and artistic expression activities developed with children and teenagers highlighted the power of Frans Krajcberg's legacy for the areas of art and education. The methodological approach I used, the narration of life stories and drawing as pedagogical tools, allowed for a deep immersion in the artist's trajectory, awakening in students a sensitive and critical view of the relationship between art, life and the environment. I believe that the text can be an important contribution to studies on innovative teaching practices and reflects the need to integrate art and education in the formation of citizens who are aware of and committed to ecological balance.

Finally, this work reveals the relevance of Frans Krajcberg's life story, storytelling, and the creative act in the language of drawing and its transformative capacity in art and education, inspiring future teachers and students to adopt sustainable practices and a critical awareness of human actions on the planet. Through the integration of biographical narrative and visual arts, this text highlights the central role of education through art in shaping citizens who are aware of and engaged with the world around them. I hope that the experience presented here will inspire future research and positive interventions in the field of art education.

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INTERVIEW WITH PAULO ARTAXO¹

Fábio Zuker

Fábio Zuker: For those who still have questions, let's go back to basics: what is climate change and how does it affect life on the planet? And what is Brazil's role in this scenario? In a recent lecture, you mentioned that the main cause of climate change is the burning of fossil fuels (about 89% of emissions). What does this mean in practice? And how is the destruction of the Amazon connected to global warming?

Paulo Artaxo: Since the Industrial Revolution, the discovery of coal burning, initially, and later oil and natural gas, to generate energy has enabled the extraordinary development of our society. However, the other side of the coin is what we are reaping now because these fossil fuels, when burned, basically alter the chemical composition of the atmosphere and they are causing very pronounced and rapid warming of the climate across the planet as a whole.

Over the last thirty years, tropical deforestation has also contributed significantly to this situation. A small but still significant contribution, currently accounting for around 11% of greenhouse gas emissions. Thus, the challenges both in relation to COP30 (United Nations Climate Change Conference) and global governance are to make an energy transition that no longer uses fossil fuels, so that we can limit global warming.

FZ: And how does climate change affect life on Earth?

PA: Climate change plays an extremely important role in the processes that are altering biodiversity, impacting people's health, agricultural productivity and our urban areas through two main effects. One of these concerns the slow and gradual change in climate, with rising temperatures and changes in precipitation and rainfall patterns. The second effect is an increase in extreme weather events, such as severe droughts, major floods, very heavy rainfall, and so on.

In other words, we are witnessing an intensification of extreme weather events, whose primary impact concerns the health of the population, which becomes more vulnerable to rising temperatures — as was evident in the heat waves recorded in Brazil in 2025. The first two months of the year were marked by exceptionally high temperatures,

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especially in the Southeast region. In addition, droughts in the Cerrado and Amazon regions have severely affected both ecosystems and agricultural productivity.

FZ: With regard to energy transition and power generation, what other energy sources could be used in contemporary societies to replace fossil fuels?

PA: Well, today we have a relatively comfortable situation, in the sense that solar and wind energy generation are cheaper than fossil fuel generation.

Solar and wind energy technologies are mature enough. From an applicability point of view, today you can install photovoltaic energy generation panels in any home, at competitive prices and much lower than the burning of fossil fuels.

So, yes, we do have alternatives to burning fossil fuels, although they also present challenges. One of the main ones is the so-called intermittency: there is no solar energy generation at night, obviously, and wind energy production tends to be lower during this period. Even so, Brazil is in a privileged position. About 60% of our electricity comes from hydroelectric power plants, and we have an interconnected national electricity system. This makes it possible to combine sources: using solar and wind energy during the day and resorting to hydroelectric energy at night, ensuring stability in supply.

FZ: One criticism often levelled at solar and wind energy is that they do not generate as much energy as burning fossil fuels. How do you see this debate?

PA: Oh no! Solar and wind energy can generate much more energy than burning fossil fuels. There is no limitation, particularly in tropical countries like Brazil. The incidence of solar energy is extremely high, so there are no limitations.

As for wind energy, it can be generated on land, especially in coastal areas, or at sea, through offshore production — as is the case in the North Sea, where large wind turbines are installed in the ocean and supply England with energy. In Brazil, this offshore potential remains largely untapped, despite its immense size.

So, essentially, the limit is an investment that you can make to generate these energies, and not a physical limitation.

FZ: What about cars and urban mobility? What technologies have been produced in this energy transition effort?

PA: One of the major issues in the energy transition concerns the transport sector. This includes transport by ship, plane, car and truck, all freight transport, as well as trains.

Trains are already almost entirely electrified in Europe and the United States, but this is not the case for cars, and the future of the car is the electric car. Electric car technology has evolved greatly, particularly in China, where we have vehicles with a range of 500 to 600 kilometers before you need to recharge the vehicle.

The big problem with electric cars today is that you have a battery that weighs basically a ton, even a ton and two hundred kilos. In other words, a very, very large battery, so much so that to transport a person weighing eighty kilos, you have to carry a ton of battery with you wherever you go.

This is obviously a totally inefficient process, but there are solutions to this. One solution is to make much smaller cars for urban use with very small batteries that you can plug into a power outlet and charge, for example, overnight at home or during the day at your office. This is perfectly feasible with the technology we have today at very competitive prices. So, there are some electric cars in India and China, which cost around ten thousand US dollars (about R\$ 56,000 Brazilian reais). They are small city cars, much lighter than large cars such as those made by Tesla.

There are numerous advantages to electric cars in urban areas. First, the elimination of car noise. Secondly, the elimination of air pollution in urban areas, which today kills thousands of people around the world. This is because electric cars do not emit greenhouse gases or pollutants. The future lies in electric transportation. But this transition will take a few decades.

FZ: Climate change affects absolutely every aspect of human life: access to water, food, health, urban planning, the economy, gender relations. A central issue is inequality, especially when looking at a country as unequal as Brazil. How does climate change interact and relate to issues of inequality and, above all, to a question that has been raised by climate justice movements: will the poorest people, those who have contributed least to carbon emissions, be the most affected?

PA: Consider this: if you look at who has air conditioning at home, meaning that on a hot day they can enjoy a more comfortable temperature indoors, you will see that it is middle-class and upper-class families.

When you look at the areas that are flooded in São Paulo, all of them are low-income neighborhoods, made up of the poorest families. Therefore, those who suffer most from the impacts of climate change are low-income populations, both in cities and rural areas.

What we saw, for example, in Rio Grande do Sul, in last year's floods, were very low-income families who lost everything in an instant because of heavy rains. When landslides occur in Petrópolis or Serra do Mar, here in São Paulo, it is very rare to see the home of a wealthy individual affected by these landslides.

This is true here in Brazil, but it is also true between countries. For example, the impact of climate change on Sweden, Denmark, or Norway is much less than on the average population of Brazil or a country in Africa. So, this is an important aspect of climate change: those who will actually suffer from climate change are low-income populations, as we can already clearly see.

FZ: One point that is rarely discussed when we talk about climate change, but which is fundamental, concerns the oceans. Especially in Brazil, with such an extensive coastal area. What role do oceans play in climate regulation? And what does ocean acidification mean?

PA: We must never forget that our civilization is based on continental regions, but 75% of the area of our planet is water: the oceans. And water has a very important property, which is its enormous thermal capacity. What does this mean? It means that it absorbs a lot of heat for a relatively small increase in temperature.

And what is happening is that the oceans are absorbing more of the excess heat. As a result, the oceans are warming up. And with the increase in atmospheric carbon dioxide concentrations, they are also becoming more acidic, because atmospheric CO₂ dissolves in water, forming carbonic acid that alters the pH of the oceans. This affects all biota in all oceans, but in particular microorganisms that have skeletons formed by limestone.

When you acidify water, these skeletons are dissolved, and these organisms end up dying. In other words, we are facing strong potential to alter the entire oceanic food chain. Furthermore, as the temperature increases, the water expands and, as it expands, the ocean level rises. They have already risen by an average of 24 centimeters across the planet as a whole, and the forecast is that, if we continue on our current trajectory, the sea will rise by around one meter by the end of this century.

All these changes will have a very strong impact on two important issues. First, all our beaches and all our cities in coastal areas. Brazil has 8,500 km of coastal areas that are very sensitive to rising sea levels. The second damage concerns our infrastructure. Brazil is a country with a very high number of ports. And a port with a water level one meter higher than it was a few decades ago will certainly have navigation problems. In

addition to ports, we have other infrastructure near coastal areas, such as Santos Dumont and Galeão airports (both in Rio de Janeiro), which will certainly be submerged if sea levels rise by one meter.

FZ: Ambassador André Corrêa do Lago, president of COP30, recently stated that change is inevitable, whether by choice or catastrophe. Last year, 2024, we experienced a series of disasters: floods in Rio Grande do Sul, droughts and fires in the Amazon, as well as intense heat waves across the country. Do you believe that we are on a path towards change by choice? What decisions need to be made for these changes to happen and avoid the catastrophic scenario described above?

PA: The first change, the most important one that we hope will be accelerated at COP30, is the gradual abandonment of the exploration and use of fossil fuels, particularly oil. Without this, which is the essence and basis of climate change, all other decisions are merely palliative measures.

However, today, on the planet as a whole, Brazil is an exception in this regard. Brazil generates more than 80% of its energy sustainably, through hydroelectric, solar and wind power. However, Brazil stands out among the G20 members, as all other countries use fossil fuels as the basis of their energy matrix.

So, the economy of the planet as a whole is based on the use of fossil fuels. First, you do not make this transition overnight. And second, you need huge investments to change the current trajectory of fossil fuel use in every country on the planet.

These are difficulties that we should have faced 20 or 30 years ago, which would have allowed us to be in a much more comfortable situation than we are now. It is not a catastrophic situation, in the sense that it is not the end of the world, but we will certainly warm the planet by at least an average of three degrees Celsius over the course of this century.

FZ: However, greenhouse gas emissions continue to rise. We have the United States going against the grain, with the withdrawal of the country, once again, from the Paris agreement. In Brazil, our national scenario has its own particularities: a government that has delivered very impressive figures for controlling illegal deforestation in the Amazon and, at the same time, political pressure to approve studies to verify the feasibility of oil exploration in the Amazon mouth, which implies more CO₂ emissions into the atmosphere. How do you see this scenario and the possibility of Brazil taking on some kind of international leadership role? What other major players in global politics could act in this scenario?

PA: The withdrawal of the United States does not mean that everything is going down the drain. The United States is one of the 196 countries that have signed the Climate Convention. It is an important country, obviously, but it is not everything. And what we are observing is that other countries will occupy the space that the United States used to occupy, in particular, obviously, China. This is a geopolitical issue, in which the United States is basically handing China a leading role on a silver platter, one that it would have had to fight very hard to achieve. And now it is getting it basically for free.

Even so, it is clear that the largest economy on the planet has a huge impact on the fight against climate change. Let's not downplay that role. We are facing a major setback for the planet. There is no doubt about that. On the other hand, this will encourage other countries to further reduce their emissions, invest more in energy transition and, in doing so, offset some of the United States' emissions. Another aspect is that the United States will make its economy dirtier and less competitive on the international stage. And, in the end, the one who will lose the most from these actions is the United States itself.

FZ: Holding the COP in Belém, one of the main cities in the Amazon, generated a lot of enthusiasm in the country. But we have also seen discouragement regarding the possibility of energy transition. There is particular weariness regarding COPs, and the role of oil companies in the last two conferences, in Azerbaijan (COP29) and the United Arab Emirates (COP28) — countries defined by many political scientists as “petro-states”, such is the centrality of oil in their economies. Is there anything positive to be expected from COP30 in Brazil?

PA: Unlike recent COPs held in countries heavily dominated by the oil industry, such as the United Arab Emirates and Azerbaijan, COP30 is taking place in Brazil, a country where the oil lobby has less influence, although it is still present. This raises the expectation that, in Belém, the influence of the oil industry will be reduced.

It is important to make it clear: it will not disappear. At the COP in Baku (Azerbaijan), for example, thousands of lobbyists worked hard to prevent the final declaration from including a commitment to phase out fossil fuels. And they were successful.

It is still too early to predict the outcome in Belém, but there are signs that oil companies may play a less prominent role.

FZ: Thank you very much, Professor Paulo. Would you like to add any final thoughts?

PA: I think there are two important points. First, the Brazilian population must take into account that Brazil is one of the countries that will be most affected by climate change. Brazil is one of the most vulnerable countries to climate change. Why is that? Because a three to four degrees' increase in temperature in Stockholm, Berlin or New York has a much smaller impact than a three or four degrees' increase in temperature in Teresina, Palmas, Cuiabá or Brasília, which are cities that already live at the upper limit of human survival from a temperature point of view.

Furthermore, Brazil is highly vulnerable because its economy is overly dependent on agribusiness, and rainfall in Central Brazil and the eastern part of the Amazon is being significantly reduced. As a result, the country, which is essentially an exporter of water through agribusiness, will lose competitiveness on the international market. This is already happening and will only intensify. This leads us Brazilians to rethink what kind of future we want for our country, because a future based on agricultural productivity will undoubtedly not be as productive as it has been until now.

These are key issues for Brazil. We are extremely vulnerable due to our tropical location, our economic system and also our electricity generation system. It is worth remembering that 60% of our electricity is generated by rain, which is undergoing significant changes.

So, what we see is that Brazil needs to pay much more attention to the impacts of climate change on our economy, our society, our energy system and our population. And we have to adapt to this new climate as quickly as possible, to reduce the damage we will suffer in the coming decades with climate change. These are very fundamental issues in Brazilian society, and we need to work on them properly.