

Bioculturality of the Tembé People: a case study on strategies of r-existence in the Terra Indígena Alto Rio Guamá (TIARG), Pará, Brazil

Bioculturalidade do povo Tembé: um estudo de caso sobre estratégias de r-existência na Terra Indígena Alto Rio Guamá (TIARG), no Pará, Brasil

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Abstract: This article analyzes bioculturality as a strategy of r-existence of the Tembé-Tenetehe Indigenous Peoples in the face of environmental and territorial threats to Terra Indígena Alto Rio Guamá (TIARG) in Pará. Bioculturality, understood as the interdependence between biodiversity, culture, and linguistic diversity, is essential for understanding the relationship between indigenous peoples and their territories and for maintaining their identity and survival. The research, employing a qualitative approach, was based on a field and literature search, including participant observation, and was conducted between 2023 and 2026 in several TIARG villages. The Tembé-Tenetehe, originally from Maranhão, have experienced displacement and a strong dynamic of colonialism, exacerbated by the territorial invasions that occurred within TIARG in the 1970s. Climate change, biodiversity loss, and territorial conflicts profoundly threaten their cultural and spiritual practices. Elements of the fauna and flora essential to the holding of biocultural events have become scarce, hampering their rituals and the transmission of knowledge. Despite these adversities, Tembé has led initiatives of cultural recovery, reforestation, bioeconomy, and territorial management, integrating traditional knowledge with contemporary techniques. Youth have taken on a prominent role in defending the territory, strengthening the people's resilience and generating hope for future indigenous generations. The study concludes that evaluating bioculturality is vital to ensuring the continuity of the Tembé way of life and reinforces the importance of public policies that respect and promote the rights and autonomy of indigenous peoples.

Keywords: biocultural heritage; cultural resilience; cultural memory; biodiversity loss; indigenous rituals; Pará Amazon.

Resumo: Este artigo analisa a bioculturalidade como estratégia de r-existência dos indígenas Tembé-Tenetehe, diante das ameaças ambientais e territoriais que incidem sobre a Terra Indígena Alto Rio Guamá (TIARG), no Pará. A bioculturalidade, entendida como a interdependência entre biodiversidade, cultura e diversidade linguística, é essencial para a compreensão da relação dos povos indígenas com seus territórios e para a manutenção da identidade e sobrevivência dos povos indígenas. A pesquisa, de abordagem qualitativa, baseou-se em pesquisa bibliográfica e de campo, com observação participante, realizado entre 2023 e 2026 em diversas aldeias da TIARG. Os Tembé-Tenetehe, originários do Maranhão, sofreram deslocamentos e forte dinâmica de colonialismo, agravada pelas invasões territoriais ocorridas na TIARG na década de 1970. As mudanças climáticas, a perda da biodiversidade e os conflitos territoriais ameaçam profundamente suas práticas culturais e espirituais. Elementos da fauna e da flora essenciais à realização dos eventos bioculturais tornaram-se escassos, prejudicando seus rituais e a transmissão de saberes. Apesar das adversidades, os Tembé têm protagonizado ações de resgate cultural, reflorestamento, bioeconomia e gestão territorial, integrando saberes tradicionais com técnicas contemporâneas. A juventude tem assumido papel de destaque na defesa do território, fortalecendo a resiliência do povo e gerando esperança para as gerações

ind genas vindouras. O estudo conclui que a valoriza  o da bioculturalidade   vital para garantir a continuidade dos modos de vida Temb  e refor a a import ncia de pol ticas p blicas que respeitem e promovam os direitos e a autonomia dos povos origin rios.

Palavras-chave: patrim nio biocultural; resili ncia cultural; mem ria cultural; perda da biodiversidade; rituais ind genas; Amaz nia paraense.

1 Introduction

In the contemporary world, we witness an increase in environmental threats, the advancement of globalization, and exploitative policies that impact indigenous populations and their territories, affecting their ecosystems and, above all, the survival of traditional knowledge, languages, and ways of life rooted in millennia-old interactions with nature. Deforestation, land grabbing, and other predatory activities jeopardize the environment and the cultural survival of these peoples.

The Temb -Tenetehar are indigenous people originating from the Tenetehara Nation, from the upper Pindar  River, in Maranh o, who migrated to Par  in the mid-19th century, settling in the basins of the Acar , Capim, Guam , and Gurupi rivers (Dias, 2010; Sales, 2000). Currently, most of them live in the Terra Ind gena Alto Rio Guam  (TIARG), in the northeastern region of Par , located between the right bank of the Guam  River and the left bank of the Gurupi River. They have a very strong relationship with the forest, practice traditional agriculture, sustainable management of natural resources, and utilize extensive knowledge about biodiversity. Furthermore, they integrate rituals, plants, and symbolic animals into their cosmology.

The successive invasions of their territory since the 1970s have led to a reduction in biodiversity and have imposed limitations on the practice of the Temb -Tenetehar people's traditional traditions. The loss of biocultural elements has compromised the full realization of their rituals, the transmission of knowledge, and the continuity of their ethnic identity.

From this context, the present study attempts to answer the following question: how does bioculturality constitute a strategy of r-existence for indigenous peoples, particularly the Temb -Tenetehar, in the face of external pressures? Therefore, the investigation is based on the following auxiliary questions: 1) How does the preservation of local biodiversity and traditional knowledge contribute to the maintenance of the culture and territory of the Temb -Tenetehar? 2) How does the scarcity of specific biological elements impact the continuity of rituals and the transmission of ancestral knowledge?

Bioculturality emerges as an alternative for the re-existence and preservation of the identity of indigenous peoples, offering a holistic perspective for biodiversity conservation. According to Maffi (2014), bioculturality is a recent concept that addresses biological diversity in an interconnected way with culture, establishing an integrated relationship

between biodiversity, cultural diversity, and linguistic diversity, highlighting an interdependence between the survival of human societies and the preservation of biodiversity. This interdependence provides a fundamental approach to understanding the relationship of indigenous peoples with their territories. In the case of the Temb -Tenetehar, this relationship manifests itself in the sustainable use of natural resources and the transmission of ancestral knowledge.

The relationship between indigenous peoples and biodiversity has also been discussed internationally based on the concept of Traditional Ecological Knowledge (TEK), understood as the set of knowledge, practices, and beliefs historically constructed by traditional populations in direct interaction with ecosystems (Berkes et al., 2000; VijayKumar, 2019). This knowledge encompasses spiritual, cultural, and environmental dimensions, guiding sustainable forms of nature management and conservation. In this sense, global studies indicate that many indigenous territories coincide with areas of high biological diversity, demonstrating that biodiversity conservation is directly related to the maintenance of indigenous cultures and cosmologies (Stepp et al., 2004; Garnett et al., 2018). For the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2019), indigenous knowledge systems are of fundamental importance in addressing current environmental crises, particularly in the face of climate change and ecosystem degradation.

It is necessary to understand the intrinsic relationship between indigenous cultures and biodiversity, especially in a context of environmental degradation and threats to traditional ways of life. Bioculturality emerges as a key point for understanding how indigenous peoples have resisted external circumstances that compromise their territories and their knowledge, through a reflection on the conservation and r-existence strategies that these peoples adopt to ensure the continuity of their cultures and the environment that sustains them.

This research aims to analyze bioculturality as a strategy of r-existence among the Temb -Tenetehar indigenous people, in the face of environmental and territorial threats affecting the TIARG (Terra Ind gena Alto Rio Guam ), in Par .

2 The Temb -Tenetehar People: historical context

The Temb -Tenetehar indigenous people have lived in the state of Par  since the mid-19th century, and since then they have been distributed from the Gurupi River to the headwaters of the Guam , Capim, and Acar  rivers (Dias, 2010; Sales, 2000). In 1945, the Terra Ind gena Alto Rio Guam  (TIARG) was created by decree no. 307, of March 21, 1945, which reserved the land for the Temb , Timbiras, Kaapor, and Guaj s, with an area of 279,897 hectares, between the right bank of the Guam  River and the left

bank of the Gurupi River (Decreto n  307, 1945). As a result, the Temb  were relocated from their former villages to the interior of the newly created territory.

Before the creation of TIARG, the Temb  of Guam ¹ lived on the left bank of the Guam  River in ancient villages, most notably the S o Jos  village, which is a reference point for the ethnic group's cultural memory. On the other hand, the Temb  of Gurupi² lived along the banks of the Gurupi River, mostly in the state of Maranh o. One of the important villages for the Temb  of Gurupi was the Igarap  das Pedras village, also in Maranh o, where the family of Captain Ver nica lived. Captain Ver nica was a Temb  leader with a significant cultural legacy for the present day, and she only crossed over to Par  in the 1990s with her family to found the Teko-Haw village.

The Temb  people preserve elements of a social organization based on specific kinship structures. According to Wagley and Galv o (1961), the family is the most important unit of the Temb 's extensive social structure, made up of other families with kinship ties. Although the traditional clan hierarchy has undergone transformations throughout the colonial process, territorial invasions, and assimilationist policies implemented in the 20th century, the notion of belonging to descent groups continues to guide community life and the succession of leadership. This structure keeps alive the protocols of alliance and the spatial distribution of families in the villages, ensuring that kinship protects the ethnic group from the cultural fragmentation imposed by the surrounding society (Ribeiro & Meira, 2021). Kinship relations continue to play a central role in social organization, in the transmission of ancestral knowledge, and in the conduct of cultural and ritual practices. In many villages, the memory of family lineages remains associated with historical leaders, shamans, and the groups responsible for preserving cultural traditions.

From 1945 onwards, the implementation of state policies and the opening of migratory fronts revealed not a simple process of acculturation, but a marked dynamic of colonialism and external pressure. This phenomenon manifested itself through the spoliation of their worldviews and the imposition of integrationist logics, especially during the advance of migratory fronts. Colonialism here operated as a force of deterritorialization that attempted to replace the indigenous way of life with Western structures of production and thought, but which was confronted by the agency and r-existence of this people (Ribeiro & Meira, 2021). This scenario worsened in the Guam  region in the mid-20th century, reaching its peak in the 1970s, with the onslaught of economic groups and the massive invasion of squatters in the TIARG (Palmquist, 1981).

1 Indigenous people who live along the banks of the Guam  River.

2 Indigenous people living along the banks of the Gurupi River.

The initial milestone in the TIARG invasion was when the farmer Mejer Kabacznike, a neighbor of TIARG, occupied and deforested approximately 6,000 hectares of the reserve to establish pastures, from the Guam  River to the Piri  River, and opened a road within TIARG, which encouraged and facilitated the occupation of new areas by other farmers and settlers, supported by the political power of the region (Alonso, 1999). These invasions caused large-scale deforestation, especially in the Guam  region, leading to the disappearance of wild plants and animals traditionally used by the Temb  in their therapies and rituals.

In the accounts of the indigenous man Iz dio, in 1980, the Temb  no longer spoke their own language, had lost their songs, dances, and crafts, and in their own territory lived as foreigners and marginalized people, considered by the *caboclos* (people of mixed Indigenous and European descent) as usurpers of the land “Os Temb : em busca da indianidade perdida?”, 1980 (“Os Temb : em busca da indianidade perdida?”, 1980). Interethnic marriage, encouraged by the very indigenous affairs agencies, was one of the factors that contributed to the erasure of indigenous culture and further distanced the Temb  from their roots. According to Palmquist (1981, p. 2), “from miscegenation with whites they acquired caboclo traits, and their only bond of identity is community life and self-recognition as indians”.

Thus, the Temb  people transformed their experiences, reinterpreting their relationships and giving new contours to their daily lives in the villages, which were monitored and controlled by agents of the indigenous affairs agency, both the SPI and FUNAI. They needed to invent, and reinvent, the ways in which they dealt with and related to others and their imposing practices, expressing a great deal of creativity to defend and “safeguard”, in their own terms, the references of Tenetehar-Temb  identity and culture, even if these fell into apparent invisibility or “dormancy” in this process (Ribeiro & Meira, 2021, p. 22).

According to Palmquist (1981), the future of the Temb  people was seriously threatened, and to reverse this scenario, it was necessary to regularize their lands and safeguard their indigenous identity. The territory was the scene of many land conflicts, which caused uncertainty about the maintenance of the lands for the Temb . In the 1990s, a great decline in Temb  culture and identity was already noted and recorded in reports from CIMI and FUNAI itself.

Faced with these serious threats, the indigenous people awoke to the need to resist and fight to reclaim their indigenous identity, because only in this way could they claim their territory, which had not yet been demarcated, although it had been created since 1945. The struggle for territory became the central focus of discussions among indigenous people, politicians, and indigenous affairs organizations. For the Temb , according to Ribeiro and Meira (2021, p. 03), “fighting for the territory means defending life for

current and future generations, as well as for the other beings that also inhabit it: animals, plants, spirits, white people, etc”.

Thus, for the Temb  people, the territory is not limited to a geographical space, but encompasses all the relationships present within it, whether material or immaterial. These relationships are directly related to the existing biocultural heritage, involving cultural and biodiversity elements, as well as spiritual conceptions about the enchanted beings and spirits of the forest, who play an important role in protecting this and all elements of symbolic value for this people.

3 Methodology

This paper is a case study, with a qualitative approach that, according to Gil (2021, p. 57), aims to “investigate the lived experience of people and complex social environments, from the perspective of the social actors themselves”. The study is based on bibliographic and field research.

The bibliographic research was carried out using institutional reports (Indian Protection Service – SPI, National Foundation for Indigenous Peoples – FUNAI, Socio-environmental Institute – ISA and Indigenous Missionary Council – CIMI), academic literature on bioculturality (Luisa Maffi, Victor M. Toledo and Narciso Barrera-Bassols, Fikret Berkes and Darrell Posey) and on public policies and the history of the Temb -Tenetehar people (Noemia Sales, Sara Alonso, Benedito Ribeiro, M rcio Meira and Cl udia Kahwage). The field research was carried out in the villages of Fr squeira, Ita- Putyr, S o Pedro, Sede and Tawari, in the TIARG, from July 2023 to January 2026.

The TIARG is located in the northeastern mesoregion of Par , encompassing the municipalities of Nova Esperan a do Piri  (approximately 149,000 hectares), Paragominas (approximately 93,000 hectares), and Santa Luzia do Par  (approximately 37,000 hectares), and bordering, in Par , the municipalities of Garraf o do Norte, Capit o Po o, Viseu, and Cachoeira do Piri , and, in Maranh o, the Alto Turia u Indigenous Land (Valente, 2017) (Figure 1). According to the Instituto Brasileiro de Geografia e Estat stica (IBGE, 2023), there are 1,926 indigenous people living in the TIARG, the vast majority of whom are Temb .

The fieldwork involved the participation of eleven direct interlocutors, selected through non-probabilistic “snowball” sampling, that is, selection of participants based on the indication of one or more key informants (Vinuto, 2014). Five elders (three men and two women), four teachers (one man and three women), and two young leaders (men) were interviewed, ensuring the representativeness of the generational and gender diversity of the community.

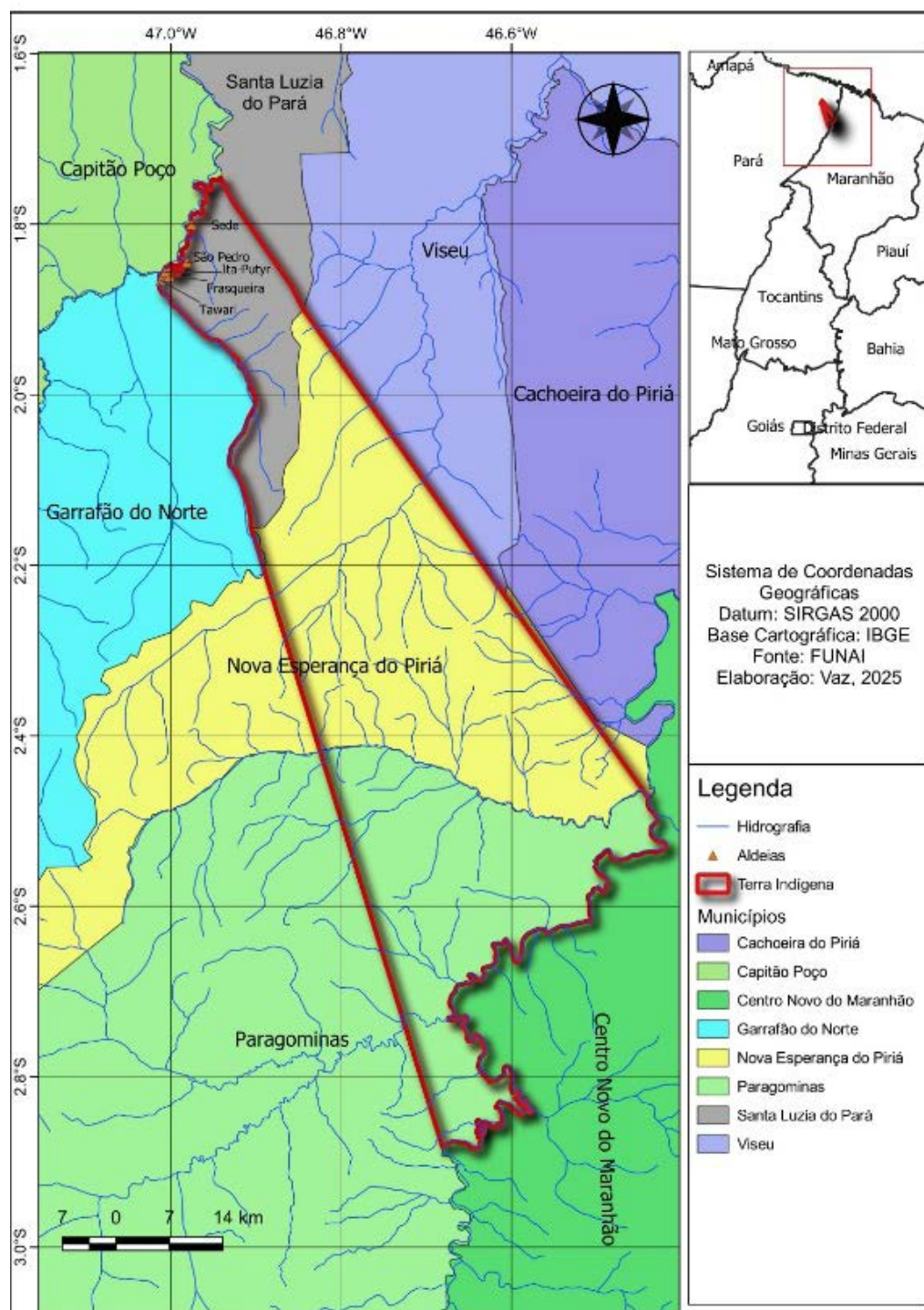


Figure 1
 TIARG Map

The research techniques applied included participant observation (Gil, 2021) and informal conversations, as these prioritize the relational nature and respect for indigenous ethical and cultural protocols, allowing interlocutors to share their knowledge in a fluid and contextualized way (Kovach, 2010). Audio, video, and photographic recordings were also made. The conversations were structured around thematic axes such as the memory of the territory before the invasions, the animals and plants

essential for the rituals (such as the Teenage Girl Festival³ and the Children's Festival⁴), and the current difficulties in carrying out these practices.

Data analysis followed the principles of Content Analysis (Bardin, 2011), beginning with the organization and transcription of audio recordings, videos, and field notes obtained between 2023 and 2026, followed by the identification of recurring units of meaning in the interlocutors' statements and, finally, by grouping the data into thematic categories. These were defined based on the frequency and relevance of the accounts regarding the interdependence between biodiversity and culture, allowing the identification of interconnections between environmental degradation and the processes of cultural weakening observed in the TIARG.

For the field research, the ethical protocols established for research with indigenous populations were followed, including authorizations from FUNAI (autoriza  o n  50/AAEP/2024), the National Council for Scientific and Technological Development (CNPq), the Research Ethics Committee (CEP) (Parecer 7.203.312/CONEP) and registration in the National System for the Management of Genetic Heritage and Associated Traditional Knowledge (SISGEN) (no. AD798AC).

4 Results and Discussion

The subjects of this research comprise members of the Temb -Tenetehar people residing in different villages of the TIARG. The characterization of the sample sought to encompass generational and gender diversity, involving elders – guardians of historical memory and ancestral rites – as well as young leaders engaged in territorial vigilance. This composition allowed for the capture of different perceptions about r-existence and bioculturality, reflecting both the concern about the loss of knowledge and the protagonism of new generations in cultural recovery. The data analysis, based on Bardin's (2011) Content Analysis, allowed for the emergence of units of meaning which, after successive stages of exploration and processing, were grouped into three central categories: Environmental Impacts on Bioculturality; Symbolism of Fauna and Flora and R-existence and Territorial Memory. These categories reveal the relationship between biodiversity, territory, and the maintenance of Temb -Tenetehar cultural identity, as discussed below.

3 The Teenage Girl Festival is the rite of passage for girls and boys into adulthood. It takes place in three stages: 1. *Tocaia* (a 7-day period of seclusion, as soon as the girl reaches menarche); 2. *Mingau* Festival (Introduction of the girl to the community, with the preparation and distribution of a porridge made from cassava); and 3. The Moqueado Festival (the initiated girls and boys are painted with *jenipapo* juice and distribute *farofa* made from specific animals that have been previously smoked to the guests. This stage lasts a week, with singing and dancing every day.

4 Initiation ritual for Temb  children.

4.1. Environmental Impacts on Bioculturality

Current socio-environmental problems have placed bioculturality under increasing threat in various parts of the world. Climate change, threats to biodiversity, depletion of fish stocks, deforestation, and societal conflicts are among the main factors that compromise this complex network of socio-ecological relationships (Toledo & Barrera-Bassols, 2015). These threats not only endanger ecosystems but also profoundly affect the ways of life, traditional knowledge, and cultural continuity of indigenous peoples and traditional communities.

Throughout the 20th century, the Temb  faced several threats to their biocultural identity, triggered by two main events: the creation of the TIARG (Terra Ind gena Alto Rio Guam ), in 1945, which required the forced displacement of the Temb  from their old villages to the new territory, altering their way of life and their traditional culture; and the invasions of the territory from the 1970s onwards, by farmers and settlers, which intensified the pressure on the biodiversity of the TIARG.

The analysis of this category reveals that environmental degradation in the TIARG is perceived as a threat to the continuity of Temb  identity. As Chief Manoel Temb  (Dhedha) of the Ita- Putyr Village points out when speaking about the future: “Today we know where we came from, we know where we are, but from here we don’t know where we’re going, because things are falling apart⁵”. This uncertainty demonstrates that the environmental impact generates a rupture in the projection of Temb  identity for future generations.

It is becoming urgent to understand and confront the multiple threats to bioculturality, recognizing the central role of local populations in the conservation of biocultural heritage. Among the threats to bioculturality, it is worth highlighting climate change, the reduction of biodiversity, and territorial conflicts, relating them to the impacts on indigenous bioculturality and, particularly, on the Temb -Tenetehar people.

4.1.1. Climate Change

Climate change and the threats it currently poses are a reflection of the rampant exploitation of natural resources to meet the needs imposed by the contemporary way of life, where consumerism has become a cultural practice of the modern world. According to the Convention on Climate Change,

‘Climate Change’ means a change in climate that can be directly or indirectly attributed to human activity that alters the composition of the global atmosphere and that is in addition to that caused by natural climate variability observed over comparable periods (Minist rio da Ci ncia e Tecnologia [MCT], 2005, p. 05).

5 Interview with Manoel de Jesus Reis Temb  (Dhedha), in the Ita-Putyr Village.

The gradual increase in temperatures is altering climatic conditions and threatening the balance of nature, resulting in eight effects stemming from climate change: higher temperatures, more severe temperatures, increased drought, an increasingly warmer and larger ocean, loss of species, insufficient food, increased health risks, and poverty and displacement (United Nations, 2022). According to Maffi and Woodley (2010), this vulnerability is intrinsically linked to cultural diversity, as most of the most vulnerable rural populations are made up of indigenous and traditional groups, who already face significant impacts.

Local environmental conditions, caused by climate change, can also influence a people's culture, such as their cuisine, clothing, and other aspects. Indeed, climate change has directly impacted traditional and indigenous communities, altering ecological patterns and affecting cultural practices. In recent years, riverside communities in the Amazon have faced more intense floods and droughts, harming fishing and subsistence agriculture. In 2023 and 2024, the worst droughts in history were recorded in the Amazon River, impacting indigenous and riverside communities that depend on the rivers for food, transportation, and cultural practices.

The 2023 drought caused many adverse effects on Amazonian communities, including the isolation of thousands of riverside dwellers and the death of river dolphins and fish, affecting fishing, access to water, and other economic activities in the region. In the Tumbira Community, in the Rio Negro Sustainable Development Reserve (RDS) in Amazonas, the drought harmed riverside dwellers who depend on the river for river transport, especially those in the economic sector, since 70% of the community's economy comes from community-based tourism (Pinheiro, 2023). The author reports that the school year was also affected, given that students living in neighboring communities were unable to reach school. Like the Tumbira community, other communities located along the banks of the Rio Negro also faced the same challenges.

In the Jarawara/Jaramadi/Kanamati Indigenous Territory, the drought in the Purus River basin has harmed 10 villages, making it impossible for school transport to function, for health teams to enter, and, most importantly, for fishing to occur, while in the Caititu Territory, fires associated with the drought have caused the death of animals and the destruction of crops, compromising food security and the health of the inhabitants (Lima & Apel, 2023).

In 2024, the drought in the Amazon was even more severe than in 2023, considered the most severe ever recorded, with significant impacts on indigenous territories in several states. In May, 17 indigenous territories experienced extreme drought and another 90 suffered from severe drought, especially in the states of Amazonas, Mato Grosso, Acre, Rondônia and Tocantins; in July, the extreme drought affected 42 territories – 53% of the indigenous territories in the Brazilian Amazon – affecting homes, schools

and health units (Ger ncia de Monitoramento Territorial Ind gena da Coiab [GEMTI], 2024).

In the TIARG, the year 2024 was marked by the incidence of several fire outbreaks caused by the long drought period, which mobilized various firefighting efforts by the Indigenous Guardians Brigade and other independent groups (Figure 2). Besides endangering the population and causing the loss of crops and hunting areas, the fires also affected the biocultural activities carried out by the Temb  people. At the Children’s Festival, held in the Tawari Village in July 2024, we observed that the organizers had difficulty finding the cip -canoinha (*Secondatia densiflora* A.DC.), whose resin is needed for the ornamentation of initiated children, as the plants were destroyed by fires in the region.

Other plant species such as the breu (*Protium*) *hepytaphyllum* (Aubl.) Marchand), juta -cica (*Martiodendron elatum* [Duck] Gleason) and tauari (*Couratari guianensis* Aubl.) are fundamental in the rituals for fumigation and spiritual cleansing during the Moqueado Festival and the Children’s Festival (already mentioned in note 3). Due to their flammable nature, these species are sensitive to fire. Regarding tauari, Bewari Temb  reports: “I’m going to talk about the tauari tree because... this deforestation, what do they call it? Burning, right? The deforestation I’m talking about is burning. Man! It kills a lot, right? This burning business...”⁶. Pin  Temb  adds that the tauari wood: “It has a little something that makes it very easy to catch fire”⁷. According to Pin , the tauari is so flammable “that its outer layer is what we use to make cigarettes... it’s because it catches fire too easily. Any fire will burn it”.

Figure 2

Temb  indigenous people controlling a fire outbreak in the TIARG, in 2024.

SOURCE: Cruz, 2024



⁶ Interview with Bewari F rias dos Reis (Bewari Temb ), in the main village.

⁷ Interview with Ant nio Sarmiento dos Santos (Pin  Temb ), in the Itua  Village.

The statements by Bewari and Pin  demonstrate that tauari is easily reached by fire and, therefore, the fires that have occurred in the region have destroyed the trees, making it difficult to collect this element for biocultural rituals. Temb .

Wildfires also affect local wildlife, as they cause animals to migrate to other regions. The correlation between the decline in wildlife and cultural fragility is direct, as the meat of animals such as the mutum (*Crax fasciolata* Spix, 1825), nambu (*Crypturellus parvirostris* Wagler, 182), porc o (*Tayassu pecari* Link, 1795) and guariba (*Alouatta guariba* Humboldt, 1812) are considered sacred in the Moqueado Festival.

The observed effects demonstrate that extreme weather events exacerbate socio-environmental vulnerability, compromising traditional cultural practices and directly threatening the bioculturality of forest peoples.

4.1.2. Reduction of Biodiversity

The decline in global biodiversity seriously compromises essential ecosystem services that underpin traditional cultures. These services include maintaining air, freshwater, and soil quality, freshwater distribution, climate regulation, pollination, pest control, and mitigating the impact of natural disasters (IPBES, 2019).

The accelerated loss of species and ecosystems caused by deforestation, climate change, pollution, and predatory economic activities directly affects sociocultural knowledge and practices that depend on specific natural elements. The progressive erosion of the diversity of traditional knowledge and value systems also implies a global loss, as there is a depletion of adaptive solutions created by humans around the world to deal with socio-environmental issues (Maffi & Woodley, 2010).

In many traditional cultures, plants and animals are not merely utilitarian resources, but symbolic elements integrated into cosmology, spirituality, and collective memory, constituting knowledge specific to that group and passed down orally from generation to generation. Therefore, indigenous peoples become vulnerable to climate change and habitat degradation, as the destruction of plants and animals compromises festivals, prayers, and rituals characteristic of different indigenous cultures.

By destroying wild biological diversity, the genetic variety of domesticated plant and animal species, the thousands of cultures identified by genes or language, and consequently, the accumulated experience in the form of local or traditional wisdom, industrial civilization is eliminating the main components of the biocultural complex of the human species (Toledo & Barrera-Bassols, 2015, p. 238).

Through the observations of Toledo and Barrera-Bassols, it is clear that the biocultural practices of traditional and indigenous communities are under constant threat, especially due to the increasing environmental

degradation that compromises the biodiversity necessary for the performance of their rituals.

The reduction of biodiversity in the TIARG has caused difficulties for performing the biocultural events of the Temb  people. The animals to be hunted for use in the rituals are increasingly distant, often beyond the boundaries of the territory, even reaching the Alto Turia u Indigenous Land, in the state of Maranh o. The festivities are held, but differ in some aspects from their original form, due to the lack, small quantity, or even the substitution of some ritualistic element.

The identified relationship between the reduced availability of certain plant and animal species and the difficulties in performing rituals is also supported by international studies on Traditional Ecological Knowledge (TEK). Berkes et al. (2000) highlight that traditional knowledge systems constitute adaptive processes historically constructed from the continuous interaction between human communities and their natural environments. According to VijayKumar (2019), the loss of specific ecological components can compromise not only material aspects of subsistence, but also symbolic, spiritual, and cultural dimensions that organize collective life. Among the Temb -Tenetehar, a similar dynamic was observed, since the difficulty of accessing species used in rituals and traditional practices directly impacts the intergenerational transmission of knowledge and the maintenance of the people's biocultural memory.

4.1.3. Territorial Conflicts

One of the problems experienced in Brazil by traditional and indigenous communities is the struggle for land, marked by conflict and violence. In 2024, Brazil reported 2,185 conflicts in the countryside, most of which involved indigenous peoples, particularly in areas of agribusiness expansion in the Amazon and Northeast regions (Comiss o Pastoral da Terra [CPT], 2025).

For approximately 50 years, the TIARG was the scene of conflicts between indigenous people, settlers, loggers, miners, and ranchers. After several attempts to remove the ranchers and squatters, some successful and others not, the federal government began peacefully clearing the non-indigenous population that illegally occupied the TIARG on May 3, 2023 (Minist rio P blico Federal [MPF], 2023). By July 2023, all invaders had been removed from the territory. However, the National Force maintained permanent surveillance until any risk of illegal reoccupation of the territory was eliminated.

Throughout the period of irregular occupation of the TIARG, natural biodiversity suffered great pressure. The primary forest was progressively replaced by pastures, large-scale agriculture, and family farming carried out by the settlers who inhabited those lands. Furthermore, logging by large timber companies from neighboring municipalities contributed to

the reduction of the forest. All these factors resulted in the forest being reduced to 2/3 of its original structure, with serious damage to biodiversity.

Several central biocultural practices of the Temb  of Guam , such as the Teenage Girl Festival and the Children's Festival, ceased to be performed for about six decades. According to Ribeiro and Meira (2021), one of the reasons was the forced displacement of the Temb  to the new territory, starting in 1945, leaving behind their ancestral reference villages, generating demotivation and sadness among the indigenous people.

All the reasons listed are related to the pressure exerted on the territory, both by civil society, which sought to occupy the territory, and by the government bodies themselves, which intended to distort the Temb -Tenetehar identity in order to reclaim the territory and divide it among migrants attracted by policies incentivizing and occupying the Amazon. Gon alves and Machado (2024) highlight that the TIARG forest has been protected more effectively as territorial rights have been guaranteed, from its identification, demarcation, titling, and finally, its definitive removal of intruders, which occurred in 2023.

Territorial conflicts directly impact indigenous bioculturality, affecting the continuity of ways of life based on the symbiotic relationship between humans and nature. Traditional knowledge, spiritual practices, and modes of social organization are also harmed, as they depend directly on local ecosystems. In conflict areas, residents restrict their access to natural areas, compromising the collection of medicinal forest products and plants and animals used in their rituals.

Therefore, the struggle for territory is also a struggle for the continuity of life systems that articulate biodiversity conservation, social justice, and cultural sovereignty. When indigenous peoples manage to secure the right to their territory, the impacts are positive for both environmental conservation and cultural preservation. Garnett et al. (2018) have observed that indigenous lands and territories of collective use are more effective in protecting biodiversity than many strictly protected conservation areas. This is because traditional management practices, guided by local ecological knowledge systems, promote ecosystem resilience and reinforce the sustainable use of natural resources.

4.2. Symbolism of Fauna and Flora

Regarding the Temb -Tenetehar people, many of their rituals depend on the use of plants and animals from the forest, which have mythological, spiritual, and therapeutic meanings fundamental to the identity formation of individuals. During the rituals of the Moqueado Festival, for example, the worship of animals as sacred symbols is observed, considered talismans and protectors, capable of transmitting knowledge and qualities essential to the lives of the initiates (Kahwage & Mendon a, 2017).

When analyzing the data in this category, it was established that the

relationship between biological scarcity and ritual fragility is central to Temb  cosmology. During our research, the nambu, mutum, porc o (queixada) and guariba were highlighted by respondents as the most important animals for the celebration of the Moqueado Festival.

According to Furtado and Pilletti (2022), these animals play a central role in the Temb  festivities, both for their physical presence and for their symbolic attributes – strength, abundance, beauty, and musicality – values that will be transferred to initiates and that will accompany them throughout their journey. The loss of these elements compromises the maintenance of the culture, the transmission of knowledge, and the continuity of cultural identity.

In initiation rituals, young initiates and guests at the Moqueado Festival are supposed to eat the meat of these animals, which are considered sacred and necessary for the diet prescribed in rites of passage, and which symbolize strength and connection with the forest, validating the young person’s transition to maturity.

The scarcity of animals such as the nambu, mutum, porc o and guariba directly impacts the ritual menu of the Moqueado Festival, as these animals possess profound spiritual significance (Furtado & Pilletti, 2022). Without access to these creatures, the rite becomes incomplete or impossible, creating a void in the transmission of practical (hunting and handling) and cosmological knowledge (myths associated with the fauna), which weakens the basis of Temb  biocultural r-existence.

When animals like the guariba disappear from the territory due to environmental pressure, the ritual cycle is interrupted or simplified, resulting in the loss of the oral transmission of narratives associated with these beings and, consequently, in the weakening of the biocultural memory of new generations. The guariba is of fundamental importance in the Moqueado Festival, as it is considered by the Temb  people as the “Owner of the Festival” without whom the festival would not be held under any circumstances⁸.

The difficulty in obtaining sacred animals (such as the nambu and the porc o) for the Moqueado Festival forces adaptations that jeopardize the rigor of the Temb  tradition. As these animals become rare in the Guam  region, and even in the Gurupi region, they have been replaced by others with some similarity. The nambu has been replaced by other birds of the same size, including domestic chickens (*Gallus gallus domesticus* L., 1758). The replacement of the mutum by the jac  (*Penelope pileata* Wagler, 1830) has been recurrent. The porc o is commonly replaced by the caititu (*Pecari tajacu*. Linnaeus, 1758). In addition to these, the decline in specimens of gavi o (*Harpia harpya* L., 1885) has led to the replacement of their plumage

8 Interview with Sinei Braga Reis Temb , in the S o Pedro Village.

with tufts of cotton in the ornamentation of the chests and arms of initiates during the Children’s Festival.

There are occasions when sacred animals are hunted well before the appropriate hunting season for the Moqueado Festival, anticipating the difficulty in obtaining them during the week of the event, and are preserved until the time of the Festival⁹. This decision is a strategy to ensure that animals fundamental to the ritual are present at the Festival. This unit of meaning proves that the absence of sacred fauna forces the Temb  people to adapt ancestral rites to avoid the total disappearance of the practice.

The plants needed for the rituals, such as tauari, breu, jenipapo (*Genipa americana* L.), and others, are also difficult to find in the surrounding forests or are ordered from other locations. According to Zytyk Temb , “Nowadays it’s not as easy as it used to be, because it’s getting harder and harder to find these plants”.

The Tauari is of utmost importance to the rituals, as its inner bark is used to make tauari cigarettes, which are used to control the action of spirits during the rituals of the Moqueado Festival and the Children’s Festival. Breu and juta -cica are also plants used in fumigations to protect the place where the Moqueado Festival takes place. Cip -canoinha is used as an adhesive to attach hawk feathers to the chests and arms of initiated boys and girls. Jenipapo is important for extracting the dye used in body painting, which displays designs specific to the Temb  ethnic group, tailored to each ritual occasion.

This scenario is particularly worrying in regions of high biocultural diversity, such as the Amazon, where the impoverishment of biodiversity also implies the weakening of indigenous languages and cultures. The decline of language, in turn, contributes to the loss of traditional medicinal knowledge, since much of the knowledge about plants and their services is codified in their languages (C mara-Lereta & Bascompte, 2021). Thus, the conservation of biodiversity is inseparable from the protection of the ways of life and territories of traditional peoples, representing a central axis for cultural and ecological sustainability.

The findings of this study also resonate with the contributions of Posey (1999), who understands indigenous knowledge as complex and integrated systems of nature management and conservation. For the author, biodiversity should not be understood solely in its biological dimension, but also from its cultural, spiritual, and symbolic meanings. From this perspective, the natural resources used by indigenous peoples go beyond a strictly utilitarian function, as they constitute essential elements for social organization, collective identity, and the continuity of ancestral knowledge. Among the Temb -Tenetehar, a similarity in this dynamic was observed, since plant and animal species used in rituals, therapeutic

9 Interview with Zytyk de Souza Reis Temb , in the Fr squeira Village.

practices, and cultural manifestations possess values that transcend their ecological materiality, integrating processes of cultural transmission and strengthening biocultural memory.

4.3. R-existence and Cultural Memory

Indigenous peoples play a fundamental role in the conservation of biocultural heritage, integrating traditional practices and ancestral knowledge that promote the sustainability of ecosystems. According to Garnett et al. (2018, p. 369), “the indigenous peoples often express deep spiritual and cultural ties to their lands and affirm that local ecosystems reflect millennia of their stewardship”. Their intrinsic relationship with nature results in effective environmental management and preservation strategies. According to VijayKumar (2019, p. 4), “this body of knowledge is deeply rooted in the cultural, spiritual, and practical experiences of indigenous communities, encompassing a holistic understanding of the natural world that is often absent in conventional scientific frameworks”.

Scientific approaches provide relevant data on ecological processes, but often disregard the contextual and experiential knowledge accumulated by indigenous peoples. However, combining indigenous knowledge with contemporary conservation strategies offers a way to address the urgent challenges of biodiversity loss, fostering a more comprehensive understanding of ecosystems and enhancing the effectiveness of conservation actions (VijayKumar, 2019). The author demonstrated that Traditional Ecological Knowledge (TEK) can contribute to biodiversity conservation and provide valuable insights into efficient resource management practices.

VijayKumar cited successful examples of integrating TEK with modern practices in New Zealand, Australia, the Andes, and the Arctic. In New Zealand, he mentioned the case of the Maori people, who obtained the recognition of legal personality for the *Whanganui* River as a living ancestor, gaining autonomy in river management and consequent environmental improvements and cultural revitalization. In Australia, fire management practices, traditionally carried out by indigenous peoples, have gained recognition for their effectiveness in biodiversity conservation and forest fire prevention. In the Andes, the *Quechua* people preserve unique potato varieties through traditional agricultural practices adapted to local biodiversity and, more recently, through the integration of modern techniques, strengthening food security, agrobiodiversity conservation, and *Quechua* cultural identity in the face of contemporary environmental challenges. In the Arctic, the *Inuit* use their TEK to manage marine resources, sustaining their way of life in an extreme environment.

In the south and southwest of Amazonas, through sustainable management actions of socio-biodiversity products, the Apurinã, Paumari, Jamamadi and Deni indigenous communities, residing in six indigenous

territories, helped preserve a carbon stock equivalent to 114 million standing trees (Neomondo, 2022).

The project *Parentas que Fazem* (Female relatives who Make it), promoted by the Funda  o Amaz nia Sustent vel (FAS), mapped 118 organizations led by indigenous women in the Amazon, promoting the appreciation of ancestral knowledge and strengthening the indigenous economy through handicrafts, agriculture, extractive activities, and traditional medicine (Funda  o Amaz nia Sustent vel [FAS], 2025).

The project Ywy Ipuranguete project aims to implement Territorial and Environmental Management Plans (PGTAs) in 15 indigenous lands across the Amazon, Atlantic Forest, Cerrado, Caatinga, and Pantanal biomes, developed with the active participation of indigenous communities, aimed to contributing to the conservation of six million hectares of Brazilian indigenous lands, promoting sustainability and protecting biodiversity (Fundo Brasileiro para Biodiversidade [FUNBIO], 2025).

The Temb -Tenetehar people carry out various actions aimed at integrating traditional practices and environmental conservation. They combine management and cultivation for reforestation plans, including fruit-bearing species, with the selection of species from direct (domestic) and indirect (forest) management, all of which are of significant importance to Temb  culture, but above all, to guarantee food for the fauna destined for hunting (Gon alves & Machado, 2024). For the Temb , hunting goes beyond food subsistence, as it is linked to their cosmology and culture.

The Temb -Tenetehar also implement their own Territorial and Environmental Management Plans (PGTAs), strengthening autonomy in the administration of their territories. These plans are developed collectively, with the participation of young people, women, elders, leaders, and holders of knowledge about fishing, agriculture, hunting, traditional medicine, and others, and integrate traditional knowledge and promote dialogue with public institutions, in accordance with the principles of the National Policy for Territorial and Environmental Management of Indigenous Lands (PNGATI) (Equipe de Conserva  o da Amaz nia [ECAM], 2016).

The Teenage Girl Festival (Figure 3), held in the villages of the TIARG, is one of the main biocultural events carried out by the Temb -Tenetehar and consists of a set of rites of passage and initiation of girls and boys into adulthood (Kahwage & Mendon a, 2017). This event represents the change from one social status to another, where elements of biodiversity, such as the aforementioned por  o, guariba, mutum, nambu, jenipapo, tauari, among others, are essential for the festival and, therefore, for the preservation of the ancestral culture expressed through the rituals and festive traditions. This celebration transmits environmental and cultural values, reinforcing the identity and social cohesion of the community, preparing the girls and boys to assume their social roles in the village (Neves & Cardoso, 2015).



Figure 3
Teenage Girl Festival, in the
Tawari Village, TIARG, 2023.

Temb  women also stand out in the production of bio-jewelry using seeds, fibers, and sustainably collected materials, an activity that strengthens financial autonomy and female empowerment and values the protection and conservation of traditional knowledge related to the sustainable use of natural forest resources (Kahwage, 2024).

Still on the Temb -Tenetehar, Gon alves and Machado (2024) state the following:

the defense of their forests, which is an active and constant stance, is the defense of a biocultural heritage, revealed in their knowledge of food culture, healing practices, and diverse artisanal productions and constructions, which are associated with the species and varieties of fauna and flora of the TIARG. Therefore, when the Temb  defend the forest, they defend their basic conditions of symbolic and material self-construction (p. 5).

Through these diverse actions, ranging from sustainable management and agroecological practices to cultural appreciation and educational innovation, the Temb  demonstrate how traditional knowledge is essential for biocultural conservation and for addressing contemporary environmental and cultural crises.

The category ‘R-existence and Cultural Memory’ highlights that, despite the history of colonialism and external pressure, the Temb  people operate an active ‘r-existence’. The categorized data shows that the memory of the invasions since the 1970s is the driving force behind current reforestation and surveillance strategies. The revival of traditional festivals such as the Teenage Girl Festival is a deliberate political action to reoccupy the territory

through culture. As reported by Walber Temb , from the Tawari Village: “For this festival to continue, we need our territory. For our territory to continue, we need to have this ritual within our people. [...] It is a power that shows that the people also exist”¹⁰. The analysis shows us that the resumption of bioculturality emerges, therefore, as an act of resistance against historical deterritorialization.

Because in order to participate, to perform our ritual, we need our territory. When our territory is devastated, we suffer, right? It is painful to see that our culture is being threatened, because our territory is under threat. So, when our territory suffers, we suffer, because we are territory, right? ... Our people exist, they resist through our ritual. ... And when our territory is devastated, the people who are invading, who are devastating the territory, are not only devastating the material, but also the immaterial. Because this is part of our spirituality as Temb  people, traditionally. Because the territory needs us. We need the territory. So, besides affecting the material part, they affect the immaterial part of the indigenous people’s territory. What would the immaterial aspect be? The spiritual (Walber Temb ).

Walber Temb ’s testimony highlights the inseparable link between territory, culture, identity, and spirituality within the context of the Temb  people. By stating that “we are territory”, the speaker expresses a relational conception of territory, which transcends the material or legal notion of land and affirms itself as an extension of the collective indigenous being itself. From this perspective, territory is not merely the space where life unfolds, but constitutes the very basis of the people’s physical, cultural, and spiritual existence. His statement reveals that traditional rituals depend directly on territorial integrity, reinforcing that cultural practices cannot be dissociated from the environment where they were historically constituted. The devastation of the territory represents a profound rupture in cultural continuity, affecting rituals, ancestral knowledge, and ways of life transmitted across generations.

5. Final Considerations

The analysis shows that bioculturality constitutes an essential strategy for the survival of indigenous peoples in the face of multiple threats to their existence, especially when it comes to issues such as territorial loss, environmental degradation, and cultural erasure. In the case of the Temb -Tenetehar, the interdependence between territory, biological diversity, and cultural practices constitutes a structuring axis of the identity and the r-existence of the ethnic group.

The study demonstrated that the impacts caused by climate change, biodiversity loss, and territorial conflicts translate into cultural and spiritual violence, revealing that territorial destruction implies the erosion

¹⁰ Interview with Carlos Walber dos Santos Temb , in the Tawari Village.

of intangible elements fundamental to the identity of the Temb -Tenetehar people, directly affecting their rituals and social organization. The destruction of symbolic plants and animals compromises the celebration of traditional festivals, such as the Festa da Menina Mo a (Teenage Girl Festival), highlighting how environmental erosion can lead to cultural erosion. The defense of territory, biodiversity, culture, and spirituality is at the heart of the Temb -Tenetehar struggle for dignity, autonomy, and cultural continuity.

On the other hand, the resumption of traditional practices, the development of PGTAs, the sustainable management of resources, and the valuing of traditional ecological knowledge demonstrate the resilience and r-existence of the Temb -Tenetehar people. Their actions in defense of the forest and culture reveal a profound ecological and spiritual understanding of the territory, concrete examples of biocultural conservation. Recognizing, supporting, and valuing these strategies is fundamental for promoting socio-environmental justice and for building effective public policies that respect the rights and ways of life of indigenous peoples.

The Temb -Tenetehar youth have been protagonists in actions to safeguard indigenous land, whether through the Indigenous Guardians Brigade, active participation in civil organizations, or simply direct involvement in the biocultural events that take place in the villages of the TIARG, thus representing, according to chiefs and elders, a great hope for the ethnic group and for the entire Brazilian indigenous nation.

The analyses presented demonstrate that, for the Temb -Tenetehar people, the biodiversity of the TIARG is a vital component of their social and spiritual structure. Biocultural interdependence reveals that the scarcity of specific fauna and flora acts as a limiting factor for ritual practices; however, the effort to revive festivals such as the Teenage Girl Festival and the Children's Festival signals a strategy of active r-existence.

It is concluded that territorial protection must go hand in hand with the strengthening of cultural practices, ensuring that future generations have the biological elements necessary for the maintenance of their cosmology. For future studies, it is recommended to monitor the impacts of community reforestation projects on the recovery of synanthropic fauna and the vitality of rites of passage.

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References

- Alonso, S. (1999). A disputa pelo sangue: reflexões sobre a constituição da identidade e “unidade tembê”. *Novos Cadernos NAEA*, 2 (2), 33-56. <https://periodicos.ufpa.br/index.php/ncn/article/view/108/162>.
- Bardin, L. (2011). *Análise de conteúdo*. Edições 70.
- Berkes, F., Colding, J. & Folke, C. (2000). Rediscovery of Traditional Ecological Knowledge as Adaptive Management. *Ecological Applications*, 10 (5), 1251–1262. <https://doi.org/10.2307/2641280>.
- Camara-Leret, R. & Bascompte, J. (2021). Language extinction triggers the loss of unique medicinal knowledge. *Proc. Natl Acad. Sci.* 118 (24), 1-5. <https://doi.org/10.1073/pnas.2103683118>.
- Cruz, F. (2024). *No Pará, indígenas do Alto Rio Guamá pedem ajuda contra incêndios*. <https://revistacenarium.com.br/no-para-indigenas-do-alto-rio-guama-pedem-ajuda-contraincendios/>
- Comissão Pastoral da Terra. (2025) *Conflitos no Campo Brasil 2024*. CPT. <https://www.cptnacional.org.br/caderno/conflitos-no-campo-brasil-2024/>.
- Dias, C. (2010). *O povo Tembê da terra Indígena Alto Rio Guamá: construindo vias de desenvolvimento local?* [Dissertação de Mestrado, Universidade Federal do Pará]. Biblioteca digital de Teses e Dissertações da Universidade Federal do Pará. <https://repositorio.ufpa.br/bitstreams/efc74710-29c9-4e19-95be-33a8e16f58cc/download>.
- Decreto nº 307, de 21 de março de 1945. (1945). Reserva área de terras aos índios Tembê, Timbira, Urubu e outros. <https://acervo.socioambiental.org/acervo/documentos/decreto-n-307-de-210345-reserva-area-de-terras-aos-indios-tembe-timbira-urubu-e>.
- Equipe de Conservação da Amazônia. (2016). *Gestão, novas tecnologias e proteção territorial: a experiência Tembê*. <https://ecam.org.br/noticias-e-editais/noticias/gestao-novas-tecnologias-protecao-territorial-a-experiencia-tembe/>.
- Fundação Amazônia Sustentável. (2025) *Povos indígenas: aliados essenciais na proteção da Terra*. <https://fas-amazonia.org/povos-indigenas-aliados-essenciais-na-protecao-da-terra/>.
- Fundo Brasileiro para Biodiversidade. (2025). *Ywy Ipuranguete: Conservação da Biodiversidade em Terras Indígenas*. <https://www.funbio.org.br/terras-indigenas-avancam-na-protecao-ambiental-e-gestao-sustentavel-no-brasil/>.
- Furtado, M. de S. & Pilletti, E. A. (2022). Saberes do Ritual da Moça na construção do Sujeito Tembê, no Território do Guamá. *Periferia*, 14 (1), 46-68. <https://doi.org/10.12957/periferia.2022.55900>.
- Garnett, S.T., Burgess, N. D., Fa, J. E, Fernández-Llamazares, A., Molnár, Z., Robinson, C. J., Watson, J. E. M., Zander, K. K., Austin, B. Brondizio, E. S., Collier, N. F., Duncan, T., Ellis, E., Geyle, H., Jackson, M. V., Jonas, H., Malmer, P., McGowan, B., Sivongxay, A. & Leiper, L. (2018). A spatial overview of the global importance of Indigenous lands for conservation. *Nature Sustainability*, 1, 369–374. doi: 10.1038/s41893-018-0100-6.

- Ger ncia de Monitoramento Territorial Ind gena da Coiab. (2024). *Amaz nia   Beira do Colapso: Boletim Trimestral da Seca Extrema nas Terras Ind genas da Amaz nia Brasileira* (2a ed.) Coiab. <https://acervo.socioambiental.org/sites/default/files/documents/c3d00076.pdf>
- Gil, A. C. (2021) *M todos e T cnicas de Pesquisa Social* (7a ed.). Atlas.
- Gon alves, J. da S. & Machado, E. F. (2024). Ca a e biodiversidade entre os Temb : uma reflex o a partir do conceito de Floresta Antropog nica. *Cadernos de Agroecologia*, 19 (1), 1-6. <https://cadernos.aba-agroecologia.org.br/cadernos/issue/view/14>.
- Instituto Brasileiro de Geografia e Estat stica. (2023). *Censo Demogr fico 2022: Ind genas, primeiros resultados do universo*. <https://biblioteca.ibge.gov.br/index.php/biblioteca-catalogo?view=detalhes&id=2102018>
- Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. (2019). *Summary for policymakers of the global assessment report on biodiversity and ecosystem services*. https://files.ipbes.net/ipbes-web-prod-public-files/inline/files/ipbes_global_assessment_report_summary_for_policymakers.pdf.
- Kahwage, C. M. C. (2024). *Bioj ias do Povo Temb : mulheres ind genas e produ  o de arte com sementes*. (v. 3). Ideflor-Bio.
- Kahwage, C. M. C. & Mendon a, G. B. (2017). Manifesta  es Culturais: K wi'u Haw e Wyra'u Haw (Festa do Mingau e Festa do Moqueado). In: Instituto de Desenvolvimento Florestal e da Biodiversidade. *Gest o Ambiental e Territorial da Terra Ind gena Alto Rio Guam : Diagn stico Etnoambiental e Etnozoneamento* (pp.95-120). Ideflor-Bio.
- Kovach, M. (2010). *Indigenous methodologies: Characteristics, conversations, and contexts*. University of Toronto Press. https://www.researchgate.net/publication/235413280_Indigenous_methodologies_Characteristics_conversations_and_contexts.
- Lima, D. & Apel, L. (2023). *Quatro meses de seca na Amaz nia: equipes do Cimi Regional Norte I apresentam os impactos aos povos ind genas*. CIMI. <https://cimi.org.br/2023/12/quatro-meses-de-seca-na-amazonia-equipes-do-cimi-regional-norte-i-apresentam-os-impactos-aos-povos-indigenas/>.
- Maffi, L. (2014) *Biocultural Diversity Toolkit: an introduction to biocultural diversity*. Terralingua.
- Maffi, L. & Woodley, E. (2010) *Biocultural diversity conservation: a global sourcebook*. Earthscan.
- Minist rio da Ci ncia e Tecnologia. (2005). *Conven  o-Quadro das Na  es Unidas sobre Mudan a do Clima*. MCT.
- Minist rio P blico Federal. (2023). *Em cumprimento de senten a favor vel ao Mpf, governo inicia retirada de n o ind genas de terra ind gena no Par *. <https://www.mpf.mp.br/pa/sala-de-imprensa/noticias-pa/desintrusao-terra-indigena-alto-rio-guama>.
- Na  es Unidas. (2022). *Causas e Efeitos das Mudan as Clim ticas*. <https://www.un.org/pt/climatechange/science/causes-effects-climate-change>.
- Neomondo. (2022). *Atividades produtivas de povos ind genas conservam de 114 milh es de  rvores na Amaz nia*. <https://neomondo.org.br/biodiversidade/atividades-produtivas-de-povos-indigenas-conservam-de-114-milhoes-de-arvores-na-amazonia>.
- Neves, I. S. & Cardoso, A.S.P. (2015). *Patrim nio Cultural Temb -Tenetehara: Terra Ind gena Alto Rio Guam *. Iphan-PA.
- Os Temb : em busca da indianidade perdida? (1980, janeiro/fevereiro). *Porantim*, 3 (15), p. 7. <https://www.docvirt.com/docreader.net/docreader.aspx?bib=HemeroIndio&pagfis=34267>.
- Palmquist, S. (1981). *Temb : a amea a da extin  o de um povo*. Cimi Norte II. <https://acervo.socioambiental.org/acervo/documentos/os-tembe-tenetehara>.

- Pinheiro, K. (2023). *Sem respirar e sem  gua: impactos da seca hist rica no Amazonas*. <https://oeco.org.br/reportagens/sem-respirar-e-sem-agua-impactos-da-seca-historica-no-amazonas/>.
- Posey, D. A. (Ed.). (1999). *Cultural and Spiritual Values of Biodiversity*. UNEP/ Intermediate Technology Publications.
- Ribeiro, B. E. da S. & Meira, M. (2021). Tudo era ind gena: territ rio, exerc cios tutelares e processos de r-exist ncia entre os Tenetehar-Temb s no s culo XX. *Acervo*, 34 (2), 1-25. <https://revista.an.gov.br/index.php/revistaacervo/article/view/1691>
- Sales, N. P. (2000). *Press o e Resist ncia: os  ndios Temb -Tenetehara do alto rio Guam  e a rela  o com o territ rio*. UNAMA.
- Stepp, J. R., Cervone, S., Castaneda, H., Lasseter, A., Stocks, G. & Gichon, Y. (2004). Development of a GIS for Global Biocultural Diversity. *Policy Matters*, 13, 267-270.
- Toledo, V. M. & Barrera-Bassols, N. (2015). *A mem ria Biocultural: a import ncia ecol gica das sabedorias tradicionais*. (R. L. Peralta Trad.). Express o Popular.
- Valente, R. de M. (2017). Caracteriza  o e hist rico da terra ind gena Alto Rio Guam . In: Instituto de Desenvolvimento Florestal e da Biodiversidade. *Gest o Ambiental e Territorial da Terra Ind gena Alto Rio Guam : Diagn stico Etnoambiental e Etnozoneamento* (pp. 31-44). Ideflor-Bio.
- Vinuto, J. (2014). A amostragem em bola de neve na pesquisa qualitativa: um debate em aberto. *Tem ticas*, 22 (44), 203-220.
- Vijaykumar, R. (2019). Integrating Indigenous Knowledge and Traditional Practices for Biodiversity Conservation in a Modern World. *Environmental Reports: an International Journal*, 1 (2), 4-7. doi: <https://doi.org/10.51470/ER.2019.1.2.04>.
- Wagley, C. & Galv o, E. (1961). *Os  ndios Tenetehara: uma cultura em transi  o*. Minist rio da Educa  o e Cultura.