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XERENTE ETHNOKNOWLEDGE AND TERRITORIALITY IN THE PRESERVATION OF BIODIVERSITY

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ABSTRACT

This article addresses the relationship between the Xerente people, their territory and the environment, highlighting the centrality of ethno-knowledge and territoriality in the preservation of biodiversity and the sustainable management of natural resources. The analysis shows how the traditional knowledge of the Xerente integrates agricultural practices, resource management and protection of sacred areas, promoting ecological balance and reaffirming their cultural identity. Despite external pressures, such as the expansion of agribusiness and climate change, the Xerente people demonstrate resilience and adaptability, offering valuable lessons about sustainability and environmental conservation. The study recognizes methodological limitations and suggests the need for future research that deepens the interactions between indigenous epistemologies and public policies aimed at sustainability.

Keywords: Ethnoknowledge. Territoriality. Biodiversity.

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INTRODUCTION

The relationship of the Xerente people with the environment and their territory transcends the physical and economic dimensions, incorporating cultural, spiritual and practical values that shape their way of life and management of natural resources. This relationship, built over generations, reflects a deep ethno-knowledge that is revealed in sustainable practices, social organization and respect for biodiversity. The territory, for the Xerente, is not only a space of occupation, but an essential component of their collective identity, where traditions, spirituality and subsistence strategies are intertwined.

However, this dynamic has faced significant challenges, especially in the face of pressures caused by exogenous development models, such as the expansion of agribusiness, the exploitation of natural resources, and the reduction of their traditional territories. These threats impact not only the environmental balance of the region, but also the continuity of ancestral knowledge and the maintenance of a culture closely linked to the environment. Despite these adversities, the Xerente demonstrate resilience by adapting their practices and reaffirming their cultural identity in the face of the transformations imposed.

This study seeks to understand how the territoriality and ethno-knowledge of the Xerente are articulated in their relationship with the environment, exploring practices that guarantee the preservation of biodiversity and sustain community life. Through an approach that values both the practical and symbolic aspects of this relationship, the analysis allows us to highlight the relevance of indigenous knowledge in the contemporary context, especially as a viable and necessary alternative in the face of environmental crises and the limitations of public conservation policies.

XERENTE KNOWLEDGE AND THE DYNAMICS OF AGRICULTURAL CYCLES: BETWEEN TRADITION AND CONTEMPORANEITY

The traditional knowledge of the Xerente people plays an essential role in the dynamics of agricultural cycles, configuring themselves as an example of cultural resilience in a context of socio-environmental transformations. This knowledge is deeply rooted in the Xerente worldview, where agriculture is not only an economic activity, but also a spiritual and communal element that connects the people to the land and their ancestors. Agricultural practice, in this sense, transcends food production, and is also a mechanism for cultural preservation and collective identity (Farias, 1994).

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The Xerente's relationship with agriculture is guided by a sophisticated understanding of natural cycles. The observation of weather patterns, moon phases and fauna behavior are integrated elements of agricultural planning. This knowledge, passed down orally through generations, forms a basis for sustainable practices that contrast with the models of intensive soil exploitation introduced by external influences. In this scenario, the Xerente reaffirm their role as guardians of practices that favor environmental balance (Ramos, 1986).

The socio-environmental transformations caused by the expansion of agribusiness and forced territorial occupation put these ancestral knowledges at risk. The loss of territory, a central element for subsistence and agricultural practice, represents a threat not only to food security, but also to the maintenance of Xerente's cultural identity. The struggle for the preservation of their lands reflects an active resistance against hegemonic forces that ignore the importance of traditional sustainable management (Lima, 2016).

At the same time, globalization and technological advances bring challenges and opportunities for the Xerente people. Ethnomathematics, for example, emerges as a field that connects tradition to contemporary demands, by valuing indigenous knowledge as an integral part of a dialogue between cultures. This field highlights how the Xerente use mathematical concepts in their agricultural practices, showing the richness of a knowledge that is both local and universal (D'Ambrosio, 2001).

Xerente agricultural practices are also deeply intertwined with biodiversity preservation. Crop choice and crop rotation demonstrate a deep respect for local ecosystems, promoting biological diversity and environmental resilience. This knowledge contrasts with monocultural practices that often lead to soil degradation and biodiversity loss, highlighting the relevance of traditional knowledge in times of global environmental crisis (Ravagnani, 1986/1987).

Spirituality is another aspect that permeates the Xerente's relationship with the land. Agricultural ceremonies celebrate the interconnectedness between humans, nature, and the divine, reinforcing community and spiritual values. These rituals are moments of cultural reaffirmation and resistance, in the face of external pressures that seek to standardize practices and devalue local knowledge (Perrone-Moisés, 1992).

However, the insertion of the Xerente into broader economic systems brought new dynamics to their agricultural practices. The need to adapt to foreign markets often conflicts with traditional values, generating tensions between cultural preservation and

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modernization. This dilemma requires public policies that respect and integrate indigenous knowledge as part of the solutions for sustainable development (Araújo et al., 2006).

The training of indigenous teachers, as highlighted in specific studies, has proven to be an effective strategy for valuing and transmitting this knowledge in schools. This educational process not only strengthens cultural identity, but also promotes awareness of the importance of traditional agricultural practices in environmental preservation and community development (Rodrigues et al., 2009).

SUSTAINABLE MANAGEMENT AND MODES OF BIODIVERSITY PRESERVATION FROM THE XERENTE PERSPECTIVE

Unlike Western approaches, which are often guided by a utilitarian view of nature, the Xerente understand the territory as a space of shared living, where human beings, animals, plants, and natural elements coexist in an interdependent network. This holistic perception shapes the ways of preserving biodiversity, ensuring that their practices contribute to the ecological balance and the continuity of species (Farias, 1990).

Agricultural practice, one of the pillars of Xerente's livelihood, illustrates this relationship well. Crop rotation methods and polyculture systems prevent soil exhaustion, promoting a renewable and balanced use of natural resources. Unlike the monoculture model that predominates in agribusiness, the Xerente diversify their plantations, not only to ensure a varied diet, but also to preserve local biodiversity. This practice sustains a relationship of respect with the land, where each resource is used responsibly, avoiding waste and environmental imbalance (Ravagnani, 1986/1987).

Traditional knowledge about medicinal plants also exemplifies the contribution of the Xerente to the preservation of biodiversity. This knowledge, transmitted orally for generations, is the result of a continuous interaction with the local flora. The Xerente recognize the therapeutic properties of diverse species and use this knowledge in their health practices, often without the need to exploit large amounts of resources. By valuing native species and their role in ecosystems, they contribute to the maintenance of biological diversity in their territory (Lima, 2016).

Decisions about hunting, fishing, and gathering materials are often made by consensus, taking into account not only the immediate needs of the community, but also the long-term impact of these actions on the ecosystem. This collective approach ensures

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that resources are used equitably and sustainably, avoiding overexploitation and ensuring the renewal of natural cycles (Farias, 1994).

Rituals and spiritual practices also play a central role in environmental conservation. For the Xerente, the earth and its elements have spiritual meanings that go beyond materiality. Sacred areas, for example, are protected as spaces of connection with ancestors and divine forces. These areas often coincide with regions of high biodiversity, where native species find refuge. Thus, Xerente spirituality acts as a natural barrier against environmental degradation, protecting ecosystems that are often neglected by conventional conservation policies (Perrone-Moisés, 1992).

Hunting and fishing practices among the Xerente are equally regulated by social and ethical norms that prioritize sustainability. Instead of exploiting species on a large scale, the Xerente adopt selective strategies, respecting breeding periods and ensuring that animal populations can recover naturally. In addition, there is a deep respect for hunted animals, seen as part of a cycle that involves reciprocity and balance. These practices contrast with the predatory exploitation that often characterizes hunting activities in external contexts (Ramos, 1986).

This interaction of the Xerente with rivers and water resources is another example of their sustainable management. Rivers are not only sources of water, but also habitats for various species and spaces for community living. The use of water resources is carefully balanced, so as to avoid pollution and degradation of watercourses. This respectful relationship ensures the continuity of aquatic life and the availability of clean water for future generations (Araújo et al., 2006).

Speaking of forest conservation, the areas are not only sources of wood and other materials, but also habitats for species that are fundamental to the balance of the local ecosystem. The sustainable management of these areas includes the rotational use of spaces for collection and the natural recovery of the areas used. This approach ensures that forests remain biodiversity reserves, protecting species that depend on this habitat for survival (Mendes, 1990).

The relationship of the Xerente with the territory also involves a territorialized understanding of environmental preservation. The space is not seen in a fragmented way, but as an integrated whole, where each element has its role in the balance of the whole. This view contrasts with the fragmented approaches that often guide public policy,

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demonstrating that indigenous resource management can serve as a model for broader conservation strategies (Oliveira, 2013).

TERRITORIALITY, ETHNOKNOWLEDGE AND THE XERENTE RELATIONSHIP WITH THE ENVIRONMENT

The relationship between the Xerente people and the territory they occupy is not reduced to a mere geographical link. For them, the territory is a living space, loaded with symbolic, spiritual and practical meanings, being a structuring element of their collective identity. Unlike Western notions of possession or ownership, Xerente territoriality reflects an integrative vision, in which land is an extension of the community itself. This perspective shapes their interaction with the environment, promoting practices that not only respect, but enhance natural ecosystems (Farias, 1994).

Ethnoknowledge, or traditional knowledge accumulated over generations, plays a central role in the way the Xerente manage and relate to the territory. This knowledge encompasses practices for the sustainable use of resources, identification of native species with medicinal, food or symbolic functions, as well as methods for environmental recovery. It is a knowledge in constant evolution, which incorporates new challenges without abandoning the bases inherited from the ancestors (D'Ambrosio, 2001).

However, this symbiotic relationship with the territory faces significant pressures. The advancement of infrastructure projects, such as roads and hydroelectric dams, as well as the expansion of agribusiness, directly impacts the Xerente's ability to maintain traditional practices. The reduction of territorial space compromises not only food security, but also the ecological balance and the continuity of traditional knowledge. These threats reveal a constant tension between the dominant development model and indigenous sustainability (Lima, 2016).

One of the most striking aspects of Xerente territoriality is the spatial organization of the villages. The villages are not randomly distributed, but follow criteria that reflect both ecological functionality and cultural meanings. The proximity of water sources, the existence of areas for cultivation and the presence of sacred sites determine the choice of inhabited space. This organization reveals a deep knowledge of the territory and an ability to plan occupation in such a way as to minimize environmental impacts (Farias, 1990).

Spirituality is another inseparable element of Xerente's relationship with the environment. Many of the places considered sacred are, in practice, areas of high

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biodiversity, which become naturally protected because of their association with the myths and rituals of the people. These sacred areas not only preserve plant and animal species, but also ensure the maintenance of cultural practices that reinforce collective identity (Perrone-Moisés, 1992).

The management of the territory is also linked to the preservation of water. For the Xerente, rivers are veins that connect the land, symbolizing both the continuity of life and the cyclical movement of nature. This understanding translates into practices that avoid pollution and waste, in addition to promoting the conscious use of water resources. The relationship with the waters demonstrates a dynamic balance, where human use and ecological preservation coexist (Araújo et al., 2006).

The hunting and gathering practices of the Xerente are clear examples of how ethno-knowledge guides sustainability. When selecting species for hunting, the Xerente consider not only local abundance, but also reproduction cycles and the maintenance of populations. Likewise, the collection of fruits and roots follows criteria that avoid the exhaustion of resources, ensuring that they are available for future generations. This care for natural renewal reflects an environmental ethic rooted in the Xerente culture (Ramos, 1986).

Agricultural cultivation, while modest in scale, is deeply integrated with knowledge about soil and climate. Crop rotation techniques, the use of polycultures, and the adoption of practices that minimize erosion reveal a sophistication that is often ignored by conventional farming systems. The Xerente do not see agriculture as a simple economic activity, but as part of a larger cycle, where the soil is constantly nourished and renewed (Ravagnani, 1986/1987).

The biodiversity present in the Xerente territories is a source of constant learning. Each plant, animal or mineral has a specific function within the ecosystem and often a symbolic or practical role in the culture. This detailed knowledge is transmitted orally, reinforcing the bonds between generations and ensuring that ancestral wisdom continues to be relevant even in the face of external changes (Lima, 2016).

The interaction between tradition and innovation is a central theme in Xerente's relationship with the environment. Although the foundations of their ethnoknowledge are deeply traditional, the Xerente do not reject innovations that can complement their practices. However, this incorporation of new elements occurs in a critical way, always prioritizing the maintenance of environmental and cultural balance. This posture evidences

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an adaptive capacity that contrasts with the predatory model of Western development (Baladier, 1976).

The challenges faced by the Xerente in relation to the protection of their territory also raise questions about the effectiveness of public policies. Although there are laws that recognize indigenous rights, the implementation of these norms is often insufficient to protect territories from external threats. The need for a more effective articulation between the state and indigenous peoples is essential to ensure that ethno-knowledge continues to be a tool for territorial management (Araújo et al., 2006).

Xerente cosmology offers important lessons about how humans can coexist with the environment harmoniously. The view that land is a collective good, to be cared for and shared, contrasts with the logic of individualistic exploitation that characterizes many contemporary societies. This worldview not only preserves the environment, but also promotes more supportive and equitable relationships among community members (Farias, 1994).

Xerente knowledge also challenges the traditional categories of Western science. By integrating ecological, spiritual, and social knowledge, they offer an interdisciplinary approach that can enrich debates on sustainability. The inclusion of ethnoknowledge in environmental education and territorial planning programs is an opportunity for dialogue between epistemologies that often ignore each other (Rodrigues et al., 2009).

The impacts of climate change are further proof of the resilience of the Xerente. Despite the difficulties imposed by changes in the water regime and temperatures, the Xerente have been able to adapt their territorial management practices. This resilience is not only technical, but also cultural, reflecting the ability to renew traditions without losing their essence (Lima, 2016).

The maintenance of indigenous territory is fundamental not only for the Xerente, but also for the global environmental balance. Studies show that indigenous territories are often more effective in conserving biodiversity than formalized protected areas. Recognizing the contribution of the Xerente to environmental preservation is an essential step in reevaluating territorial management policies (Mendes, 1990).

The transmission of ethno-knowledge to the new generations is one of the greatest challenges faced by the Xerente. Formal education often distances itself from local realities, leaving little room for learning traditional practices. Projects that integrate indigenous knowledge into school curricula are essential to ensure that future generations

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continue to preserve and enrich the cultural and environmental heritage of the Xerente people (Rodrigues et al., 2009).

Xerente territoriality, therefore, is not only a matter of material survival, but also of cultural reaffirmation. The territory is the space where history, spirituality and everyday practice meet, forming the basis of a collective identity that resists the forces of assimilation. This resistance is, in itself, a form of environmental preservation, by reaffirming ways of life that prioritize harmony with nature (Farias, 1990).

The recognition of the role of ethnoknowledge in the territorial management of the Xerente requires changes in the way Brazilian society perceives indigenous peoples. Instead of treating them as obstacles to progress, it is necessary to value them as strategic allies in the fight for sustainability. This change in perspective has the potential to enrich not only academic debates, but also political and social practices (D'Ambrosio, 2001).

CONCLUSION

The present study reaffirms the importance of territoriality and ethnoknowledge in the preservation of biodiversity and in the sustainable management of the environment from the Xerente perspective. The integrated relationship between the people and the territory transcends utilitarian practices, revealing a worldview that values the interdependence between human beings, nature and spirituality.

Agricultural practices, the management of natural resources, and the protection of sacred areas highlight the Xerente's contribution to sustainability in a global context of environmental crisis. Despite the threats posed by external pressures, such as the expansion of agribusiness and the reduction of indigenous lands, the Xerente demonstrate resilience and adaptability, reaffirming their traditional values and knowledge.

This article, therefore, shows that indigenous epistemologies not only preserve environmental balance, but also offer relevant paths to rethink development models and public policies aimed at sustainability.

LIMITATIONS OF THE RESEARCH

Although the study explored central aspects of the relationship between the Xerente and the environment, some limitations must be acknowledged. First, the approach was predominantly qualitative and theoretical, based on secondary literature, which restricts the inclusion of empirical data from experiences and interviews with the Xerente people

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themselves. This gap can limit the depth of analysis when addressing current community perceptions in the face of contemporary challenges. In addition, the focus on documentary sources, often from non-indigenous authors, can bring an intermediated perspective, making it difficult to have direct access to the Xerente voices and their original interpretations.

In conclusion, the most recent impacts of public policies and climate change have not been analyzed in depth, which suggests the need for continuous studies to monitor the evolution of this dynamic relationship between the Xerente and the environment.

RECOMMENDATIONS FOR FUTURE STUDIES

To deepen the understanding of the relationship between the Xerente and the environment, it is recommended to carry out field research that incorporates participatory methodologies. Future studies could include interviews and workshops with leaders and members of the Xerente community, allowing for a richer and more detailed analysis of their perceptions and practices in relation to sustainability and biodiversity preservation. Such approaches can capture nuances that often escape purely documentary analysis.

It is important to reflect on the temporal and geographical scope of the investigation, exploring how different Xerente villages have adapted their practices to recent socio-environmental changes, such as the impact of climate change and increasing urbanization on their lands. In addition, it would be valuable to compare the practices of the Xerente with those of other indigenous peoples, identifying convergences and differences that can enrich debates on public policies for environmental conservation.

In this way, a greater integration between traditional and academic knowledge is suggested, promoting dialogue between indigenous epistemologies and contemporary science. Interdisciplinary projects, involving anthropologists, ecologists, educators, and the Xerente themselves, can contribute to the development of more inclusive and sustainable public policies. These studies can also collaborate to strengthen the appreciation of indigenous knowledge in the national and international context, ensuring that their practices continue to inspire innovative solutions to global sustainability challenges.

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