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Is Ethnobiologist Training at Risk? Challenges of a Brazilian Graduate Program

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ABSTRACT

The Graduate Program in Ethnobiology and Nature Conservation (PPGEtno, an acronym in Portuguese) was established in 2012 at the Federal Rural University of Pernambuco (UFRPE, an acronym in Portuguese) in collaboration with other institutions in Northeast Brazil. PPGEtno addressed the urgent need to train professionals sensitive to biodiversity conservation issues through an interdisciplinary approach that values traditional knowledge and the relationship between people and nature. Despite its success, PPGEtno faces administrative challenges due to regulatory constraints, which restrict coordination roles to UFRPE faculty members only, which is currently limited to just five faculty members from UFRPE, the program's host institution. The lack of faculty members aligned with social-ecological thinking at UFRPE exacerbates the situation, putting the program at risk of extinction or reduction to a research line within another graduate program. PPGEtno's academic output is significant, with 96 graduates, 1,473 published articles, and important contributions to Ethnobiology and Ecology. Its publications include high-impact journals and cover a wide range of topics. The program's closure would represent an immeasurable loss for research on biodiversity and human-nature interactions. In this manuscript, we demonstrate the impacts that the absence of PPGEtno could cause, both theoretically and practically. The continuation of PPGEtno is vital for advancing Ethnobiology as a scientific discipline, serving a critical role in training ethnobiologists and fostering new knowledge on biodiversity conservation and human-nature relationships in Brazil and across Latin America.

Keywords: Interdisciplinarity; Education; Scientific Innovation; Threats to Education.

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SIGNIFICANCE STATEMENT

This study underscores the pivotal role of the Graduate Program in Ethnobiology and Nature Conservation (PPGEtno), the first in Latin America dedicated to exploring the dynamic relationship between human societies and the natural environment. Our analysis highlights PPGEtno's contributions to the training of ethnobiologists, the promotion of interdisciplinarity, and the recognition of traditional knowledge as a fundamental component for the success of conservation initiatives and the mitigation of climate and environmental crises. Additionally, we discuss administrative challenges that jeopardize the program's continuity. By highlighting PPGEtno's substantial scientific contributions, we underscore the urgent need to preserve and strengthen this pioneering program. The potential discontinuation of PPGEtno would constitute a major setback for biodiversity research and socio-environmental conservation. Therefore, this work is a crucial call for the continued support and maintenance of PPGEtno, essential for advancing Ethnobiology in Brazil and Latin America.

INTRODUCTION

The creation of a graduate program in Ethnobiology in Brazil was a longstanding aspiration of one of the pioneers in the field, the renowned ethnobiologist Dr. Darrel Posey. Unfortunately, he did not live to see his wish come to reality (Albuquerque 2023; PPGETNO 2024). Years after his passing, in 2011, Prof. Dr. Ulysses Paulino de Albuquerque idealized and led the structuring of the project that would later evolve into the Graduate Program in Ethnobiology and Nature Conservation (PPGEtno). This program was developed through a partnership between the Federal Rural University of Pernambuco (UFRPE), the Federal University of Pernambuco (UFPE), the Regional University of Cariri (URCA), and the State University of Paraíba (UEPB) (Albuquerque 2023). In 2012, the first group of doctoral students was admitted and graduated in 2016, the same year the master's program was launched.

Thus, PPGEtno became the first graduate program in Latin America to focus on the relationship between human societies and the natural environment (Albuquerque et al. 2013). Over its 13 years of existence, the program has not only pioneered research in the field of research but has also remained at the forefront, setting a benchmark for excellence and innovation in studies involving the relationship between humans, nature, and culture. Ethnobiology is a recent field of knowledge, having gained greater recognition only in the past 20 years (Albuquerque et al. 2013). Given this fact, Ethnobiology as a science is undergoing profound transformations, including the emergence of graduate programs focused on the training of ethnobiologists across Latin America. However, graduate programs focused on the interface between humans and nature are scarce worldwide. This discipline is often relegated to a secondary position within programs primarily focused on ecology or anthropology. While significant programs were established in the Global North, such as those focused on Ethnobotany at the University of Hawaii (USA) and the University of Kent (UK), programs in the Global South, particularly in Latin America—a region of great biological and cultural diversity—remained limited.

Although pioneering, the Global North appears to

be shifting its approach to the teaching of Ethnobiology, as the graduate program in Ethnobotany at the University of Hawaii was discontinued in 2015 (UH 2025) and the program at the University of Kent was discontinued in 2024 (UK 2024). Given the discontinuation of programs focused on human-nature relationships, it is plausible to consider that the teaching of Ethnobiology, and consequently research in the field, is undergoing a crisis.

However, the Global South has positioned itself at the forefront of this field. Evidence of this shift includes the establishment of PPGEtno at the Federal Rural University of Pernambuco, Brazil, followed by the PhD in Ethnobiology and Biocultural Studies at the University of Cauca, Colombia (UNICAUCA 2016), founded in 2016, the Master's in Ethnodiversity Studies at the Federal University of Pará (UFPA 2024), established in 2024 and the Master's and PhD in Ethnobotany and Ethnobiology, established in 2024 at The University of The West Indies at Mona, Jamaica (UWI MONA 2024).

Despite these advancements in the Global South, graduate programs in Ethnobiology remain scarce, particularly those that explore the complex relationships between humans and nature rather than merely producing species lists based on traditional knowledge.

PPGEtno was created in response to the urgent need to train professionals who are attuned to issues related to biodiversity conservation, using an interdisciplinary approach that values traditional knowledge and fosters partnerships between diverse cultures and societies. As part of the structure of the Coordination for the Improvement of Higher Education Personnel (CAPES) in the area of Biodiversity, PPGEtno promotes an education that transcends traditional Biology and Ecology, integrating socio-cultural, psychological, economic, and historical perspectives-each of which is essential for the effective management and conservation of natural resources (Bosone et al. 2022; Manfredo et al. 2020).

The emergence of PPGEtno marks a pivotal moment in the training of ethnobiologists in Brazil and Latin America. Before its creation, in Brazil, researchers in the field were primarily embedded in graduate programs focused on traditional disciplines such as Botany and Zoology, which limited the scope of ethnobiological research (PPGETNO 2024). The establishment of the program enabled more focused training in Ethnobiology, encouraging a diversification of approaches within the field. This not only promotes theoretical and methodological advancements but also stimulates the expansion of knowledge in Ethnobiology (PPGETNO 2024).

PPGEtno is currently a network program, rated Level 5 (Very Good – national excellence) by CAPES, and involves the collaboration of 24 faculty members from various universities in Brazil and other countries, many of whom are internationally renowned researchers (PPGETNO 2024). This diverse faculty plays a crucial role in training the next generation of researchers. The professors are organized into three research lines:

1. **Cognitive Systems and the Use of Natural Resources** – This research line focuses on the various ways in which natural resources are appropriated, ranging from the characterization of social-ecological systems to applications in management, conservation, and bioprospecting of sociobiodiversity. It includes the analysis, description, and interpretation of classification and perception systems, as well as the transmission and variation of local ecological knowledge. A key component of this line is the bioprospecting of natural resources (fungi, plants, animals) based on traditional knowledge while adhering to all legal requirements. Faculty in this research line include ethnobiologists as well as researchers from more traditional backgrounds who collaborate closely with them.

2. **Ecological and Evolutionary Foundations of Human-Nature Relationships** – This line applies ecological and evolutionary theories and models to the study of human-nature interactions, such as optimization theories and the domestication processes of plants and animals. Unlike the first line, this one emphasizes ecology and evolution as key forces shaping human relationships with natural resources. Research topics include the incipient domestication of native plants, agrobiodiversity, landscape transformation, and the evolution of knowledge systems.

3. **Ecological Synthesis, Biodiversity Conservation, and Management** – This line applies principles, theories, and methods from population biology, population genetics, and community structure analysis to tropical biodiversity management. It encompasses studies on biodiversity characterization, conservation threats, and ecological processes, while maintaining a focus on human interactions with nature. This research line does not involve traditional zoology, ecology, or botany studies per se, but rather utilizes their theoretical and methodological foundations to address conservation-related questions. It is primarily led by faculty with traditional backgrounds in botany, ecology, or zoology.

However, despite its international relevance, the Graduate Program in Ethnobiology and Nature Con-

servation faces challenges that jeopardize its continuity.

Thus, this letter aims to highlight the importance of PPGEtno for the field of Ethnobiology, as well as for the transversal areas that comprise the theoretical scope of the program. Throughout this text, we emphasize the issues that threaten the program's existence, in addition to its theoretical and methodological significance in Brazil and Latin America.

Threats to the Existence of PPGEtno

Despite being a graduate program composed of faculty members from various universities, PPGEtno operates under a regulatory structure that allows only faculty from the host institution (UFRPE) to hold coordination positions. Currently, the program includes only five faculty members from UFRPE, representing 11.9% of the teaching staff, who rotate between the roles of program coordinator and deputy coordinator, each term lasting two years.

With the change in coordination in the first semester of 2024 and the inability of other faculty members from UFRPE to assume the role due to their commitments to projects and other administrative responsibilities, PPGEtno faces an administrative impasse that threatens its very existence.

Moreover, the program struggles to incorporate additional UFRPE faculty members due to its interdisciplinary nature and the high volume and impact of its scientific output. The main challenge lies in the limited number of faculty at the host institution aligned with social-ecological perspectives who can provide administrative support. In response, the Didactic-Pedagogical Coordination (CCD, an acronym in Portuguese) is evaluating alternatives to ensure the program's continuity. Proposed solutions include appointing a pro tempore coordinator, establishing partnerships with other universities within the network, merging with another graduate program (PPG, an acronym in Portuguese) at UFRPE, or restructuring PPGEtno as a research line within an existing PPG.

Considering the circumstances, we are facing, which other graduate programs may also encounter, the last two options are particularly problematic and have prompted us, as PPGEtno students and members of the international Ethnobiology community to write this manuscript. The threat of the program's extinction or its possible reduction to a research line within a larger structure is undesirable. Such an outcome would not only represent a significant loss to the field of Ethnobiology but also constitute a setback for socio-biodiversity research in Brazil and Latin America. For instance, the extinction of PPGEtno would lead to a substantial decrease in work involving Indigenous Peoples and Local Communities (IPLCs), who have historically been marginalized in scientific research and the formulation of biodiversity conservation policies.

The Impact of PPGEtno Members' Contributions on Ethnobiology and Nature Conservation

The establishment of PPGEtno has led to significant advancements in Brazilian science, particularly in biodiversity studies, recognizing the crucial role of the interrelationship between people and nature for conservation. This has fostered closer dialogue with IPLCs. These contributions include research with ecological, cognitive, and evolutionary implications, resulting in an unprecedented advancement in technical and scientific frameworks. The studies conducted by students and professors of PPGEtno have made significant contributions to advancing ethnobiological research in various areas, including hunting practices and wildlife conservation (Chaves et al. 2020; Borges et al. 2023); socioeconomic vulnerability and public health (Magalhães et al. 2023); human-nature relationships and landscape preferences (Moura et al. 2018); and behavioral ecology and social dynamics in primates (De la Fuente et al. 2022).

To highlight the relevance of PPGEtno, we have analyzed the formation and technical-scientific output of the program from its inception in 2012 through to 2023. Additionally, we analyzed a productivity benchmark for the program. the Impact Factor (IF) from the Journal Citation Report (JCR), an international metric (Clarivate - https://jcr.clarivate.com/jcr/home). For this analysis, we took into account the 2022 impact factor.

Over the years, PPGEtno has graduated a total of 96 students, including 62 doctoral candidates and 34 master's students. The technical-scientific production totals 1,473 articles published in journals. Regarding Impact Factor values, they ranged from 0.1 to 56.9, with most publications falling within the range of 1.1 to 4. (Figure 1). Notable journals where publications were concentrated include Ethnobiology and Conservation (IF = 1.4; Publications = 56), Journal of Ethnobiology and Ethnomedicine (IF = 3.6; Publications = 55), and Gaia Scientia (Federal University of Paraíba) (IF = not reported; Publications = 24), as shown by the ranking of the top 10 journals with the highest number of contributions from the program (Figure 2). Additionally, the program has recorded 176 paper presentations, 261 publications in conference proceedings (both national and international), and 328 books, including both complete volumes and book chapters (Figure 3).

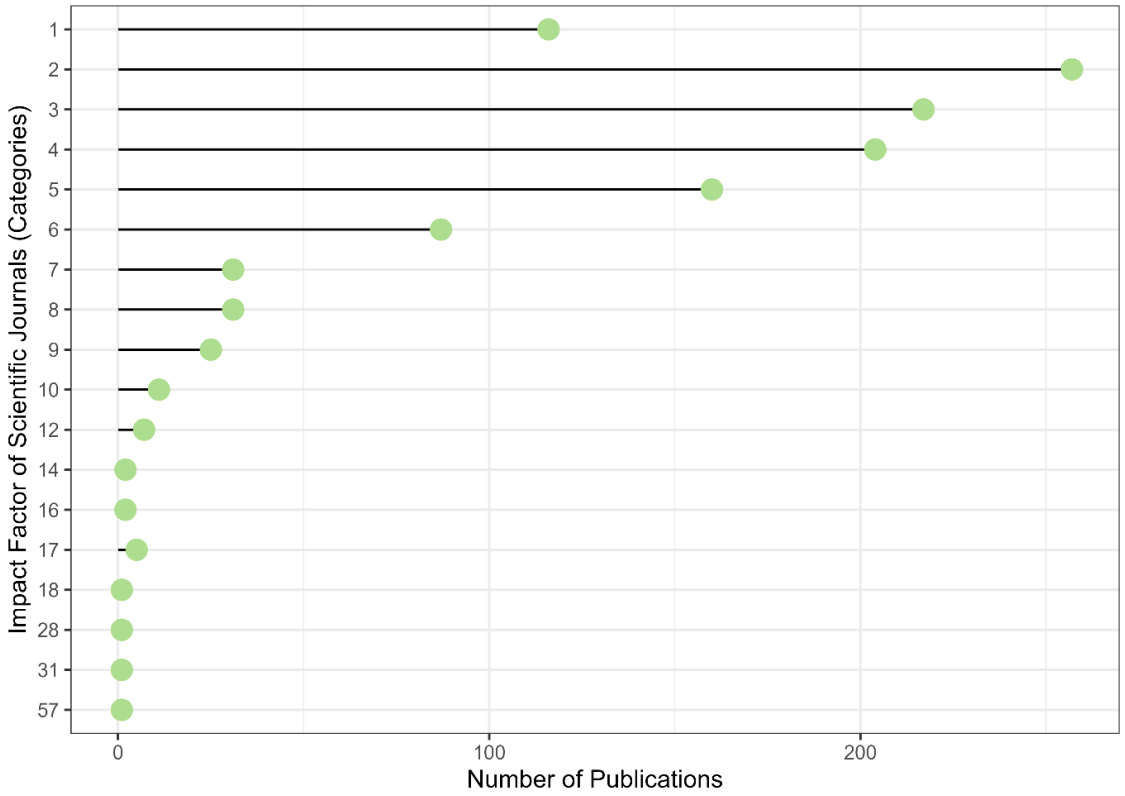

Figure 1. Publications by students and teachers in the Graduate Program in Ethnobiology and Nature Conservation by Impact Factor. Note that the Impact Factor has been categorized into 18 categories (e.g. from 0.1 to 1, from 1.1 to 2).

Community Engagement, Social Impact, and Applied Conservation

PPGEtno has been a strong social actor with IPLCs. For example, the Laboratory of Ecology and Evolution of Socioecological Systems (LEA) has been conducting ethnobiological research in partnership with the farming community of Carão in Altinho, located in the semi-arid region of Pernambuco, Northeast Brazil, for approximately 18 years. Alexandre Nascimento, Vice President of the Carão Community Association and a key leader in the municipality of Altinho highlights the significant contributions made by PPGEtno students through the LEA. For instance, workshops on medicinal and edible plants in the region have facilitated intergenerational knowledge transmission, enabling elders to share their traditional wisdom with adults, youth, and children.

Beyond knowledge exchange, PPGEtno research has played a crucial role in shaping public policies for biodiversity conservation. One such example is the study conducted by Nascimento et al. (2017), which examined the commercial relationships between intermediaries and collectors of the crab Ucides cordatus (Linnaeus, 1763). The findings of this research supported Ordinance No. 325 of the Secretariat of Aquaculture and Fisheries under the Ministry of Agriculture, Livestock, and Supply, which regulates the prohibition of capturing, fishing, and trading these animals during their reproductive period.

Similarly, another study led by Sobral et al. (2017) contributed to conservation efforts in the Araripe National Forest (FLONA-Araripe). The researchers developed indicators based on the knowledge of local extractivists to monitor target species of extractivism. These results were later presented to both the involved communities and the protected area managers, reinforcing the program's role in integrating traditional knowledge into conservation strategies.

Further exemplifying the impact of PPGEtno, Dr. Anna Karolina Martins Borges (UEPB 2021) initiated a seahorse conservation project that integrates biogeography, ecology, and ethnobiology to establish conservation priorities for endangered seahorse species in Brazil. Currently, field studies are employing a combination of direct observation and participatory mapping with local fishers, demonstrating the value of interdisciplinary and community-based conservation approaches.

Through these diverse initiatives, PPGEtno con-

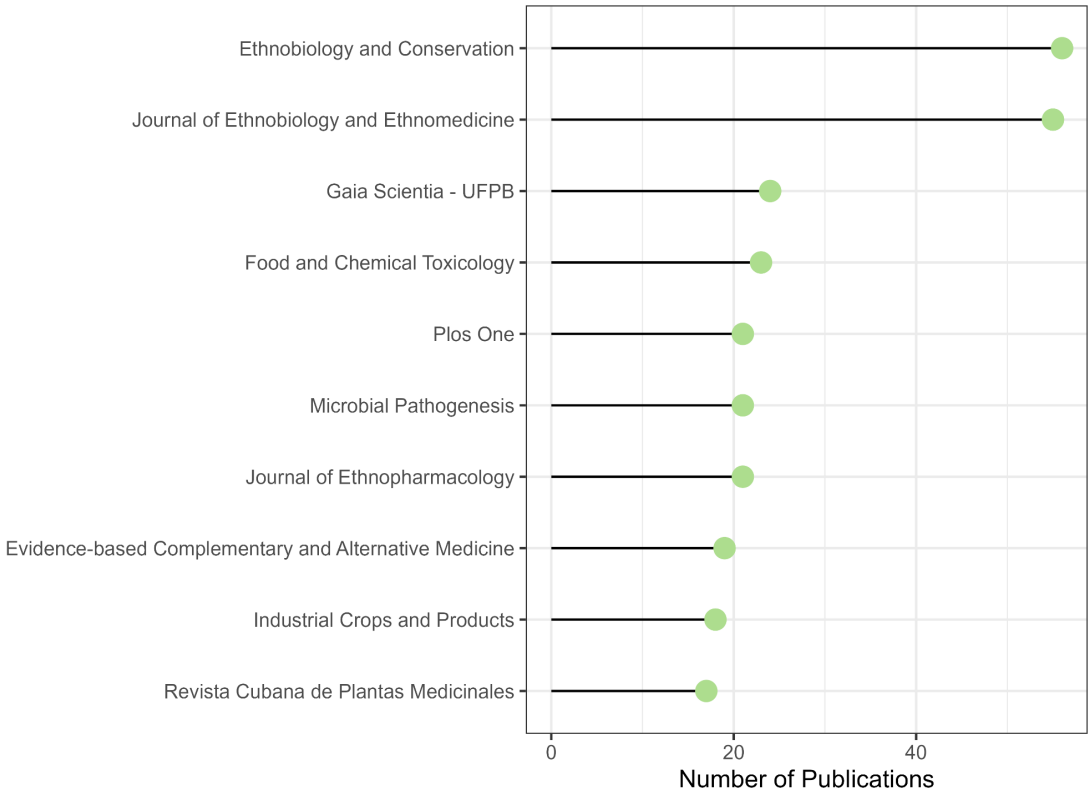

Figure 2. The top 10 journals with the highest number of publications by students and teachers in the Graduate Program in Ethnobiology and Nature Conservation.

tinues to foster both scientific advancement and real-world applications, strengthening the connection between academic research, traditional knowledge, and environmental policy.

Perspectives and Solutions

The Graduate Program in Ethnobiology and Nature Conservation (PPGEtno) has made significant strides since its establishment in 2012. However, it currently faces administrative challenges that threaten its continuity. To secure its future and maintain its contributions to Ethnobiology and biodiversity conservation, concrete solutions must be implemented alongside a broader institutional commitment. Below, we outline the primary steps being taken, as well as additional measures that should be considered to ensure PPGEtno's sustainability.

Modification of the Regulatory Structure

The primary solution already underway (In the first semester of 2025) is the modification of PPGEtno's regulatory framework. This change will allow faculty members from institutions beyond UFRPE to assume coordination roles, thereby broadening the pool of eligible faculty and alleviating the current administrative bottleneck. While this is a crucial step forward, it does not entirely resolve the issue, as the number of potential coordinators will remain limited. Further actions are necessary to fully address the administrative impasse.

Strengthening Institutional Support and Faculty Engagement

A long-term solution requires greater institutional commitment from UFRPE, including administrative support and an increase in the number of faculty members dedicated to the program. Given PPGEtno's interdisciplinary nature, efforts should be made to integrate more UFRPE professors aligned with socio-ecological research, ensuring that the program has a robust administrative structure and faculty leadership to sustain its operations.

Enhancing Interinstitutional Collaboration

PPGEtno could strengthen its ties with other universities within its network by formalizing cooperative

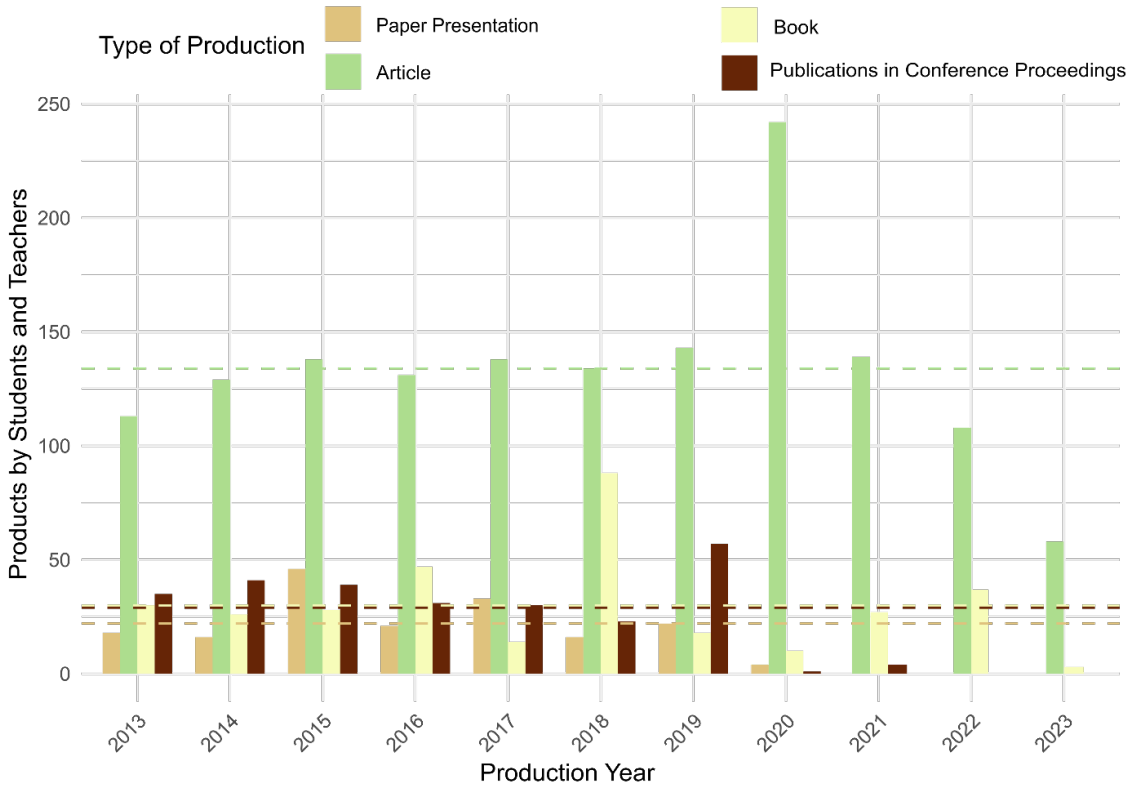

Figure 3. Products by students and teachers in the Ethnobiology and Nature Conservation Program by year. The colors of the bars indicate different types of production, divided into: paper presentation, journal article, book (note that this category covers both entire books and book chapters), and work in event annals. The dotted lines indicate the averages (considering all the years) of each type of production.

agreements for shared governance. This could include establishing a rotating coordination model that ensures stability while integrating diverse perspectives from different institutions. Additionally, forming partnerships with other graduate programs (PPGs) at UFRPE could help mitigate administrative challenges and reinforce interdisciplinary collaboration.

Expanding Financial and Logistical Support

Sustaining PPGEtno requires not only administrative adjustments but also increased investment. We urge higher administrative bodies at UFRPE (Federal Rural University of Pernambuco), as well as other universities currently part of the program's network—University of Pernambuco (UPE), Federal University of Pernambuco (UFPE), and State University of Paraíba (UEPB) — and funding agencies to prioritize support for PPGEtno, recognizing its vital role in training researchers and advancing ethnobiological knowledge. Additional financial resources could facilitate faculty expansion, student scholarships, and research infrastructure, thereby strengthening the program's impact.

CONCLUSION

The graduate Program in Ethnobiology and Nature Conservation (PPGEtno) has established itself as a fundamental pillar for research and training in Ethnobiology in Brazil and Latin America over its 13 years of existence. With its interdisciplinary and innovative approach, PPGEtno integrates biological, ecological, sociocultural, psychological, economic, and historical knowledge, which is crucial for the sustainable management and conservation of natural resources. Thus, the extinction or reduction of PPGEtno to a mere research line would represent an irreparable loss for biodiversity research and for the local communities benefiting from the program's partnerships. The robust scientific production, including high-impact publications, and the theoretical and applied contributions underscore PPGEtno's importance in advancing ethnobiological knowledge and promoting biodiversity conservation.

We do not aim to provide definitive solutions to the challenges discussed, as this requires the reflec-

tion of various stakeholders. However, we propose highlighting the urgency of addressing these issues, given the importance of maintaining the program as originally conceived and the risks associated with its merger into other research lines. Indicators of the current situation include faculty overload, with the accumulation of educational, scientific, and administrative functions, as well as inadequate remuneration for the accumulation of responsibilities in academia. Therefore, more than just the letter presented here, bureaucratic changes are needed to facilitate the transition of coordination among the different faculty members of the program, increasing the number of faculty members capable of assuming the role, regardless of affiliation with UFRPE, while respecting the program's identity and its outputs. This reflection is not limited to PPGEtno but may also be relevant to other graduate programs facing similar challenges. Faculty overload, the need for an interdisciplinary approach, and the importance of maintaining the original identity and mission of programs are universal issues in academia. The merger or reduction of specialized programs may lead to the loss of specific knowledge and a decrease in the quality of research and the training of new professionals. It is crucial for universities and regulatory bodies to consider these factors when making decisions that directly impact the structure and operation of graduate programs. Investing in solutions that promote the administrative and financial sustainability of these programs is essential to ensure their continuity and relevance in the academic and scientific landscape.

The technical-scientific production of PPGEtno is robust, with publications in high-impact journals and international recognition. The theoretical and applied contributions of the program have significantly advanced the field of Ethnobiology, highlighting the interrelation between people and nature as a crucial component for conservation. The loss of this program would represent a significant gap in scientific advancement and in the formation of researchers dedicated to socio-environmental sustainability. It is imperative to seek viable solutions to ensure the continuity of PPGEtno, preserving its autonomy and integrity. PPGEtno is more than an academic program; it is a symbol of innovation, excellence, and commitment to nature conservation and the appreciation of traditional knowledge. Its continuity is vital for the progress of Ethnobiology and for building a more sustainable and inclusive future.

We call upon UFRPE's, UPE, UFPE and UEPB leadership, funding agencies, and the broader academic community to support PPGEtno's continuity. This includes providing administrative backing, ensuring stable faculty involvement, and increasing financial investments in the program. Furthermore, we urge other graduate programs facing similar challenges to proactively address regulatory and structural limitations that may hinder their long-term sustainability. By securing PPGEtno's future, we not only safeguard an essential academic program but also reinforce the importance of interdisciplinary research in addressing pressing socio-environmental challenges. The time to act is now.

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DATA AVAILABILITY

The data used to support the findings of this study are available from the corresponding author upon reasonable request.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

CONTRIBUTION STATEMENT

Conceived of the presented idea: VMBJ.
Carried out the data analysis: ASC, GXB, JCBB, RAFG, ARM.
Wrote the first draft of the manuscript: ACAP, AMSQ, ARM, ASC, CDA, CHTM, EHCB, FIRS, GN, GXB, ISL, JAMSS, JCBB, JMGM, JMLR, MLS, PTM, RAFG, RBMS, RKSS, TGA, TMS, TBBS, VMBJ, YACS.
Review and final write of the manuscript: ACAP, AMSQ, ARM, ASC, CDA, CHTM, EHCB, FIRS, GN, GXB, ISL, JAMSS, JCBB, JMGM, JMLR, MLS, PTM, RAFG, RBMS, RKSS, TGA, TMS, TBBS, VMBJ, YACS.

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