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What Is the Role of Public History and Environmental Oral History in Supporting Conservation through Agroecology?

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Abstract: Indigenous peoples and local communities are key actors in the preservation of important biodiversity resources around the world. However, the ever-encroaching agricultural frontier and expansion of conventional agricultural practices threaten these communities, their autonomy over the land, and the traditional knowledge and practices associated with biodiverse ecosystems. Agroecology emerges as an important solution to support the continuation of agrobiodiversity, food security, and environmental conservation, but top-down solutions often do not resonate with the lived realities of traditional, Indigenous, and small-scale farming communities. This paper examines a collaborative research and narrative network developed over the past several years around traditional erva-mate agroforestry production in Southern Paraná, Brazil. It offers an example of how oral environmental history and public history can support conservation practices through agroecology. The key outcomes of this interdisciplinary, multi-dimensional research and engagement were the development of a candidacy for the system to be recognized as a Globally Important Agricultural Heritage System (GIAHS) from the Food and Agricultural Organization of the United Nations (FAO) and the implementation of a Dynamic Conservation Action Plan to address the threats and challenges farmers and communities are facing. The discussion explores two concepts that were integral to these processes, the creation of narrative networks and a focus on plurivocity. Both approaches ensured that the actions, knowledge, and narratives developed through the GIAHS candidacy were not imposed but agreed upon and generative through narrative and dialogue, remaining true to the realities and lived experiences of community members.

Keywords: oral history; environmental history; agroecology; conservation; agrobiodiversity; public history; erva-mate; yerba mate; agroforestry; GIAHS

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Citation: Nimmo, E.R.; Laverdi, R.; de Carvalho, A.I. What Is the Role of Public History and Environmental Oral History in Supporting Conservation through Agroecology? *Conservation* **2024**, *4*, 82–97. https://doi.org/10.3390/conservation4010006

Academic Editor: Iain J. Gordon

Received: 18 September 2023
Revised: 5 January 2024
Accepted: 15 February 2024
Published: 21 February 2024

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1. Introduction

Recent reports by several international organizations have highlighted the important and crucial contributions that Indigenous Peoples and Local Communities (IPLCs) make to the conservation and stewardship of the world's biodiversity [1–4]. The recent report by WWF et al. [2] estimates that 32% of global land falls within the ownership or management of IPLCs, the majority of which occur in areas that are particularly important for biodiversity. While most of these lands are in good ecological condition, the ever-encroaching agricultural frontier and expansion of conventional agricultural practices are a continuous threat to these communities, their autonomy over the land, and the traditional knowledge and practices associated with these ecosystems. As has been noted elsewhere [5–8], the destruction of ecosystems through the expansion of industrial agriculture continues to have drastic impacts on biodiversity, farmer well-being and livelihoods, soil fertility, and water and nutrient cycles, among many others.

In this context, agroecology has been cited as one of the only available solutions to these interconnected crises. Agroecology, which includes a wide range of practices and

knowledges, seeks to "mimic natural ecosystems by reorganizing agroecosystems based on the principles of diversity, synergy, efficiency, and recycling" [5] (p. 205). Furthermore, agroecology is inherently social in that it considers human actors and their well-being as integral parts of the agroecosystem, recognizing traditional and indigenous knowledges, histories, cultures, and practices, and offering rural families greater autonomy and justice in the face of the current context of corporate conventional agriculture [6].

Because agroecological practices are developed from a systemic and holistic understanding of agroecosystems, they are inherently linked to conservation, particularly for local and indigenous communities and small-scale farmers. In many parts of the world, these communities are responsible not only for supplying much of the food consumed regionally [9,10] but also for maintaining much of the world's biodiversity, as noted above. Following Berkes [11] and Cavallo [12], conservation in this sense is not used to mean preservation but rather the use of the resources within an ecosystem for human well-being, without compromising the interests of future generations and a focus on living well. Termed conservation through use [13,14], this concept recognizes that humans are integral parts of the landscape. Exclusionary conservation paradigms, which are often top-down and externally derived, create "an inherent conflict between conservation advocates and local people who depend on use of land and management of natural resources for their livelihoods" [15] (p. 571). It also forces us to recognize an "often-neglected fact: conservation and adaptation to environmental change is done by everyday people at household and local scales" [16] (p. 153). Thus, participatory and community-based strategies that integrate conservation with socioeconomic well-being and local knowledge are essential to reverting the loss of habitats, maintaining those that survive, and combating the dominant narrative of conventional agriculture as rural development and growth.

Traditional agroforestry systems are one such set of agroecological practices that integrate ecological knowledge of forest ecosystems with the production of a wide range of commodity and other cultivars, including medicinal plants and non-wood forest products. In Southern Brazil, one traditional agroforestry system that has been used for generations has been key to maintaining forest ecosystems in the region and is strongly linked to the culture and history of farming families and traditional and indigenous communities. These systems are based around the production of erva-mate (*Ilex paraguaienses*; yerba mate), a tree species whose leaves are harvested and roasted for consumption as an infusion. Erva-mate occurs naturally in the understory of the Araucaria Forest, a biome within the Brazilian Atlantic Forest, and has been consumed by human populations likely for thousands of years [17]. The knowledge of the tree and harvesting and processing techniques has its roots in the Guarani and Kaingang Indigenous cultures that live within the territory of Southern Brazil and quickly became an economic commodity for the Spanish and later Portuguese colonial empires [18].

Today, erva-mate is a key economic and cultural element of Indigenous and traditional Faxinalense and Quilombola communities, and many small-scale family farmers in Center–South Paraná state, Brazil. In traditional systems, erva-mate is cultivated in fragments of the Araucaria Forest, with a wide diversity of other species of native fruits, medicinal and therapeutic plants, animal husbandry, and other timber and non-wood forest products [19]. The agroforestry systems are part of a rationale of property or land management that includes a range of land uses and products, i.e., commodity crops, family gardens, and forests, as a means of diversifying production and ensuring family food security. Erva-mate grown in the shade of the Araucaria Forest is recognized as having a milder, less astringent flavor than the trees cultivated in high-yield monocultures [20]. It also requires significantly lower levels of investment in terms of chemical inputs and labor, as the forest environment provides more than enough nutrients to fertilize the plants [20,21]. Meanwhile, the shaded environment helps to control understory weed growth, with weed cutting being the principal labor requirement beyond harvesting. Thus, traditional erva-mate production is inherently agroecological, providing a range of ecosystem and socioecological services to families and communities.

Nevertheless, there is growing pressure on farmers to adopt higher intensity systems of erva-mate to increase production as a means of "modernization", rural development, and poverty reduction. The conventional agricultural logic of maximizing yields threatens the forest ecosystem in which traditional systems occur because greater light levels (or fewer trees for shade) results in higher levels of production. This an important consideration, as most of the remaining secondary forest fragments in the region occur on small-scale farms and in traditional and Indigenous communities [22], and it is in these fragments that erva-mate is cultivated. Another consideration is the disconnect the high-yield logic creates with IPLC's connection to the land, their traditional ecological knowledge, and the cultural identities and environmental subjectivities intimately tied to these systems. Thus, discussions of agroecology as a means of conservation must address the human, lived dimensions of these systems alongside the important ecological and environmental functions they provide across the more-than-human landscape [23]. As noted recently by Holmes et al. [24] (p. 10):

> As we adapt to the realities of our climate changed world, and support the urgent work of mitigating ecological destruction, we need to find new kinds of stories that can frame our futures in different ways. We know that the climate change scenarios that are playing themselves out across our continent and world are part of a big story, but people don't live at a global level. Responding to the local, regional experiences of climate change requires local and nuanced approaches which speak to the ways people understand their relationship with place, identity, family, community. It requires an understanding of people's history with that place.

In this context, the Globally Important Agricultural Heritage System (GIAHS) program from the Food and Agricultural Organization of the United Nations (FAO) offers a holistic approach to support agrobiodiversity conservation alongside the cultural practices, local knowledge and history, and landscapes of traditional agricultural systems. The GIAHS program recognizes agricultural systems that have developed over generations and are intimately tied with the unique ecosystem and culture in which they are found. The systems recognized as GIAHS must demonstrate how they support food security and sovereignty, the conservation of agrobiodiversity, the maintenance of cultural heritage, traditional knowledge, social organization, and the preservation of cultural landscapes [25]. They thus ensure a systemic and holistic view of agricultural systems that are linked to cultural identities, history, and social innovation. While most GIAHS candidacies take advantage of oral and public history research developed on the system (see for example [25]), few have employed oral and public history as the foundational starting point for community engagement and program development.

However, strategies to support agroecological and conservation practices must thoroughly engage with human and more-than-human histories, and the memories, knowledges, and subjectivities of farmers and community members as key subjects in their design and implementation. They must also be conscious of the important multi-species processes, symbioses, and assemblages at play across the landscape, as landscapes have histories in which human populations are an integral part of the story [26]. While such an approach has been discussed in the literature in the context of conservation and the looming crises of the Anthropocene (see for example [23,27–29]), the concepts of environmental oral history and public history as key elements to support agroecological practices and biodiversity conservation is new.

This paper examines a case study on a collaborative research and engagement network that we have been developing over the past several years around traditional agroforestry erva-mate production in Southern Paraná, Brazil. The aim is to demonstrate how human and social sciences, particularly oral environmental history and public history, have been key elements in supporting conservation practices through agroecology. There have been two key outcomes of this interdisciplinary and multi-dimensional research and engagement, the development of a candidacy for the system to be recognized as a GIAHS from the FAO

and the implementation of the Dynamic Conservation Action Plan. We discuss each of the outcomes and examine how the process and practices demonstrate the conjunction of agroecology, environmental oral history, and conservation, creating significant potential for transformative action and change.

2. Methodology

This research began in 2017 as part of a project being implemented by Embrapa Forestry in Paraná, Brazil, on the use and conservation of traditional erva-mate production and forest management system in the Araucaria Forest. The project sought to better understand and value the knowledge associated with traditional agroforestry systems to develop productive models for restoration, knowledge dissemination, and conservation of native species, along with promoting ecosystem services. Our interdisciplinary team, with expertise in environmental history, oral history, and anthropology, was asked to join the research project to gain a better understanding of the human dimension of these agroforestry systems. The project team recognized that the knowledge and practices associated with these systems were just as important to their continuation as the economic and environmental aspects. As has been highlighted by Arce Nazario [16] (p. 154),

> Oral histories introduce new questions and shed light on dynamics that cannot be seen if we only rely on the scientific narrative. . . Oral histories are especially useful to environmental and geographical research because they capture memories tied to space and experiences in the landscape. These memories situated in the landscape carry both environmental knowledge and social capital. The images they show us may be in conflict with the information extracted from statistics, graphs, and figures, but these should not be seen as conflicts challenging our duty as scientists but rather as a reminder that the environment is full of memories, and that people live with them.

Oral history methodologies play a crucial role in this process, making it possible to preserve and share narratives that would otherwise remain outside the scope of research. This approach is based on the concept of Portelli [30], who argues that oral sources are not merely discovered but co-created by the researcher. They would not take the form they do without researchers' active presence and involvement during the production of narratives in field interviews. This results in a shared authority, in which an authentic dialog takes place, and questions and answers do not follow a linear path. The researchers' agenda should therefore be aligned with the narrator's, but disagreements and other important emergences can arise, with significant creative potential. As a result, the research agenda can be radically revised [26].

The initial point of departure for the research was a commitment to Participatory Action Research (PAR), which seeks to incorporate a variety of methods and include a wide range of actors to ensure meaningful engagement, constant and iterative feedback, and the collaborative development of actions and outcomes [31]. Herein, we focused our methodological approach on oral history interviews, workshops, farmer-to-farmer knowledge sharing, farmer-led experimental research, focus groups, and community consultations. As we have argued elsewhere, "such methods also help to break down the dominant paradigms of academic research by empowering local actors to be involved in all stages of the research process, including defining the questions to be addressed, and democratize processes of research and social change by ensuring that a diversity of knowledge systems and voices are included, valued, and heard" [32].

The team conducted a series of 33 environmental oral history interviews with 39 participants. The goal of these semi-structure interviews was to document the knowledge, memories, and histories of farmers, traditional community members, and others associated with traditional erva-mate production in the Center–South of Paraná. The oral environmental history methodology included semi-structured interviews and farm visits with *erveiros* (a self-defined identity traditional producers use to distinguish themselves from *ervateiros*, or those who run industries that produce the finished product) based on guiding

themes related to the participant's life history, memories, and perceptions of the forest, and technologies, knowledge, and practices used in forest management [33–35]. Interviews were conducted on the farm to create a context in which farmers and their families felt comfortable sharing their stories and memories, often with a walk through the *erval*, or agroforestry system. This movement through the landscape created possibilities for the sharing of memories triggered by the environment and the emergence of new narratives and experiences for the participants and the team members. Interviews were recorded, transcribed, and coded based on the guiding themes, as well as those that emerged from the narrative discussions and interactions.

The oral environmental history work initially fed into the larger research project, and later developed and informed new research, engagement, and extension (Figure 1). A series of events, workshops, and discussions took place beginning in 2018 and continues to today, with local communities, civil society organizations, and other research institutions. The goals of these workshops, focus groups, and meetings are to share knowledge and practices between farmers, agencies, and practitioners; identify barriers and threats facing the continuation of these systems; and discuss collaborative action that could begin to address the challenges IPLCs face. The number of participants ranged among communities from 30 to 100, often with a predominant participation of men. Lunch and snacks were provided, always attempting to hire local families or organizations that valued organic and traditional food production. Detailed notes were taken by researchers and facilitators for each workshop/focus group for later analysis and report writing. All events included a practical aspect, in which participants visited a property using traditional erva-mate systems for discussion and dialogue.

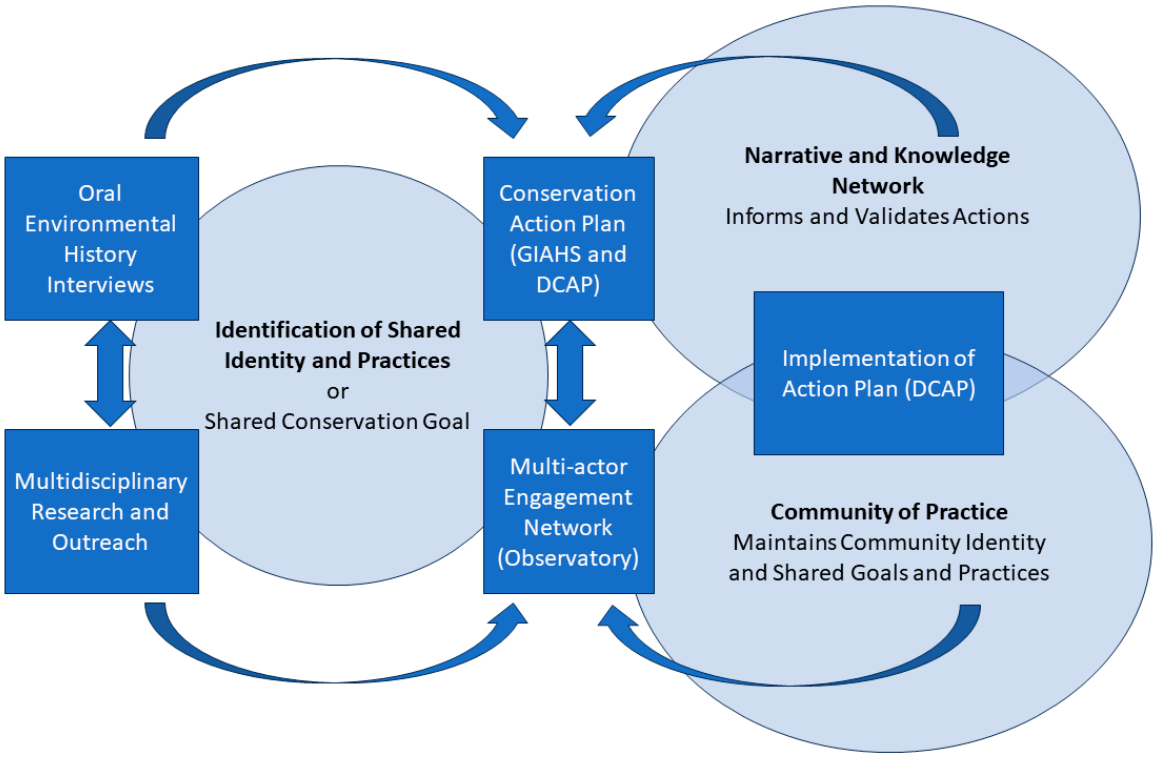

Figure 1. Schematic diagram of the multidisciplinary methodology used and main research outcomes. The methodology is iterative, with constant, multidirectional feedback among the various outcomes that emerged and were consolidated while conducting community-based conservation actions. Note that we use the development of the GIAHS candidacy and the Dynamic Conservation Action Plan (DCAP) as an example of a conservation action plan that is developed and implemented with the IPLCs involved.

The methodological focus on sharing narratives and knowledge was an important aspect of these discussions, as it opened a space to develop a narrative network, defined by Ingram et al. [36] (p. 4) "as a mutually constitutive group of actors (human and non-human) and ideas. . . [meaning] that a narrative that members of the group voice is what organizes people and gives the group structure; and, it is in the assemblage of actors that we find a community of narrators that allows the emergence of the narrative". Key features of these narrative networks are plurivocity, in which the voices of all actors and participants are expressed and listened to, and the possibilities of the more-than-human actors (i.e., the forest ecosystem, erva-mate trees, and local fauna) being engaged in the discourse [30].

These discussions began to consolidate a multi-sectoral, interdisciplinary narrative and knowledge network focused on supporting the continuation and valuing of traditional erva-mate systems. Networks of knowledge are important elements not only in communication but also in the sharing and co-creation of new and emergent knowledges, one of the pillars of agroecology, offering spaces of negotiation and mutual understanding [32,37]. Thus, the initial research project helped to launch a knowledge network that was purposefully transdisciplinary, including researchers and extensionists from federal (Embrapa Forestry), state (Public Prosecutor of Labor of Paraná, MPT-PR; Rural Development Institute of Paraná—IAPAR-EMATER, IDR-PR; State University of Ponta Grossa, UEPG), and municipal institutions (Secretaries of Agriculture and Education), and community partners including representatives of the Family Farmers' Union (FETRAF) and smallholder farming families across 11 municipalities in Southern Paraná. This network was officially established in 2019 as the Observatory for Traditional and Agroecological Erva-mate Production (*Observatório dos Sistemas Tradicionais e Agroecológicos de Erva-mate*; www.ervamate.org (accessed on 17 February 2024)) with 26 institutions and local organizations signing a memorandum of cooperation. The Observatory has since grown to include 32 institutions and is connected to international networks through the UNESCO Chair on Food, Biodiversity, and Sustainability Studies and other research and outreach projects (i.e., Laurier Centre for Sustainable Food Systems).

3. Results

The engagement of the knowledge and narrative network through the Observatory enabled the development of new ideas and strategies to begin to support and strengthen traditional and agroecological erva-mate systems. Below, we outline two major outcomes of the research to date, namely the development of a candidacy for these systems to gain recognition from the FAO as a GIAHS and the implementation of a Dynamic Conservation Action Plan developed in close collaboration across the Observatory knowledge and narrative network.

3.1. Developing the GIAHS Candidacy

Beginning in 2020, during the height of the COVID-19 pandemic, the Observatory put together a working group to lead the development of the GIAHS candidacy, with representatives from research and outreach institutions, civil society organizations, family farming unions, and erveiros. The working group was tasked with two goals: (1) consolidate the information necessary to develop the Dossier that is required as part of the submission; and (2) map out the challenges and threats to these systems and possible solutions and actions to be undertaken in the Dynamic Conservation Action Plan (DCAP), the second document required for submission. The DCAP recognizes the ever-evolving nature of these farming systems in relation to society and the environment.

Because the GIAHS program is focused on locally led and community-engaged initiatives, continued interaction and validation with erveiros and traditional and Indigenous communities was an important aspect in developing the candidacy. Following the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP; [38]), projects that aim to achieve sustainable livelihoods must adopt participatory approaches, recognize the importance of Indigenous peoples' autonomy over natural resources and related knowl-

edge, and build partnerships between Indigenous communities and other actors in society. To meet this commitment, the development of the Dossier and DCAP for the GIAHS candidacy was premised on the involvement and participation of representatives and/or partners from Indigenous and Faxinal communities. It ensures free, prior, and informed consent, as recognized in the UNDRIP and by the FAO. One of the founding principles of the candidacy is the self-determination of traditional and Indigenous communities in relation to the continuation of traditional knowledge and territorial management.

A significant challenge faced by the working group was the impossibility of visiting and engaging directly with traditional and Indigenous communities while developing the Dossier and DCAP due to the public health restrictions in place during the COVID-19 pandemic. This problem was aggravated by the lack of adequate internet access in rural communities, impeding their participation in online meetings throughout the process. Thus, the development of the candidacy relied on key people from these communities to act as interlocutors. The role of these interlocutors was to update community members on the discussions and activities proposed and to bring suggestions and comments to the working group. Google Meet meetings were held at least monthly and were recorded and made available with the minutes of the meeting in a WhatsApp group created for the candidacy to ensure access to information and the transparency of the process.

The DCAP outlines a series of cross-cutting and interconnected actions identified and developed with farmers, local organizations, researchers, and outreach workers to address the many specific and overarching threats and challenges to the conservation and continuation of these traditional agroecological systems. One important element of the DCAP was the focus on dynamism, innovation, and responses to change, while remaining true to the principles and core values of agroecological practice.

The DCAP is organized around three strategic focus areas (Table 1): Conscientization [39], Communication, and Dissemination; Cooperativism and Solidarity Economy; and Sustainable Development and Livelihoods. Considering that the DCAP is based on a knowledge network, community of practice, reconciliation, and participatory actions, the activities within the strategic area of Conscientization, Communication, and Dissemination focus on the principles of sharing knowledge and fostering dialogue. They also guide the actions and priorities across the DCAP and help to reconcile the experiences, stories, and memories among all actors—a crucial step to ensure the integration of Indigenous communities into the community of practice.

The specific objectives of the strategic area of Cooperativism and Solidarity Economy are to strengthen solidarity in the communities involved in this candidacy and support the development of specific actions in each municipality and community that address the needs of erva-mate-producing families. Meanwhile, the Sustainable Development and Livelihoods area of strategic focus encompasses all aspects related to the use and conservation of natural resources, as well as the preservation of tangible and intangible heritage in traditional and agroecological erva-mate production.

3.2. Implementing the DCAP

The pillars of implementing the DCAP are constructing a narrative or knowledge network (*dialogo de saberes* [40]) and (re)constructing a community of practice [41] around erva-mate systems. Using both approaches, erveiros are beginning to recreate and build the affective and solidarity ties of a community with shared values, histories, memories, and hopes for the future of these systems. It is a process of re-creation, as this sense of community, shared work, and common purpose is pervasive in the memories and narratives of erveiros and community leaders but is something that has fallen out of practice over the past 30 years. We would also argue that it is a process of reconciliation by ensuring that Indigenous and traditional communities are fully engaged in the development and implementation of the program, as they are often treated individually or in isolation from family agriculture and territorial development in Brazil.

Table 1. Overview of the Dynamic Conservation Action Plan.

Strategic Area and Objectives	Specific Threats to Be Addressed	Overarching Threats
Conscientization, Communication, and Dissemination		
• Promote the exchange and documentation of knowledge between family farming, Faxinal, and Indigenous communities and research and extension institutions • Implement internal and external communication strategies, including public policies, marketing, and international networks • Disseminate and socialize the importance of traditional systems through environmental education and other means of communication	• Loss (or lack) of autonomy and self-confidence to resist the agro-industrial complex • Lack of recognition in the market of differentiated products and their benefits (ecological, traditional, and sustainable) • Lack of systematization and availability of information and research results • Non-participation in local or regional forums and lack of recognition as crucial actors • Invisibility of the system from a technical perspective within research or government institutions	• Expansion of the agro-industrial complex and the pressure to implement monoculture systems with associated inputs (agrochemicals, pesticides, and chemical fertilizers) • The disintegration of traditional erva-mate systems from a cultural, social, and ecological point of view • The current political situation, dismantling of public policies, and loss and setbacks in the rights of rural workers and traditional and Indigenous communities • Oligopoly exerted by erva-mate agroindustries and dependence on large corporations • Invisibility of family farming and the silencing of traditional and Indigenous communities· Climate change and disruptions to the hydric cycle
Cooperativism and Solidarity Economy		
• Strengthen solidarity economy actions and activities in communities and create capacity among network participants • Develop strategies to strengthen solidarity communities and resulting products • Identify opportunities for system diversification	• Lack of organization and commitment to associations and solidarity actions • Poorly prepared or unengaged leaders • Lack of engagement with youth and women and lack of renewal in organizations	
Sustainable Development and Livelihoods		
• Develop research and extension that meet the demands of communities and farmers • Implement ecosystem restoration models through the network of reference properties	• Lack of primary data on communities/farmers using traditional systems • Lack of appreciation of traditional and local knowledge and associated cultures, environmental and intangible heritage	

Thus, a series of eight regional workshops, along with several farmer-to-farmer knowledge exchange events, farm visits, and mini-courses were developed and implemented in the 11 municipalities that are participants in the GIAHS candidacy. The aim of these events was to disseminate information about the candidacy and its potential, engage with and register new families interested in participating in the program, and share knowledge and practices around traditional agroforestry systems.

The workshops, which included large group discussions, smaller focus groups, and practical site visits, were organized in collaboration with local community leaders. Participation was open to farming families and community members who practice or are interested in traditional erva-mate production, as well as local farming and community organizations, such as municipal secretaries of agriculture, local chapters of family farming unions, and local cooperatives.

During the focus groups and large group discussions, several common themes emerged from the narratives that reinforce the shared identities and subjectivities around the community of practice. These include the need to create mechanisms to train new generations to properly harvest and manage erva-mate stands, the lack of recognition of this way of life as important for conservation, difficulties competing with high-productivity and high-

input systems, and a call for greater investment in research and community engagement focused on traditional, rather than conventional, systems. One of the important aspects in fostering the community of practice is that community members see themselves, their memories, and histories reflected in the discussions, building a sense of common practices and goals. Thus, the workshops functioned as a first step for farmers to begin to perceive themselves as part of a wider community, locally and regionally, and from this, community ties and solidarity can be (re)built. While an in-depth analysis of the narratives is part of our ongoing research, our preliminary analysis suggests that these narratives are common across all the municipalities in which we are working and speak to anxieties and challenges that most communities are facing. They are therefore important loci of connection among farmers, communities, and municipalities. Many of these anxieties stem from the focus of agricultural and rural development research, planning, and investment on the expansion of conventional monocultures and commodity crops, such as soybeans, and top-down, heavy-handed approaches to conservation. These, and other identified challenges, threaten the continuation of traditional knowledges, landrace/heirloom crop and animal varieties, and forest ecosystems, all of which are elements of these agroecosystems that erveiros have fought to conserve (see [34,35] for a more detailed preliminary analysis).

The practical aspects of these events were always very fruitful and required little intervention from researchers. These discussions were the foundation for creating the knowledge network that valued the voices and experiences of all involved. For example, in one knowledge network event, participants visited a farm in Cruz Machado where the younger generation on the family farm was producing erva-mate seedlings. Being in the nursery and experiencing seedling production created an environment in which several questions and doubts emerged that were answered and discussed among the farmers. One interesting debate developed around the type of substrate to use for seedling production as one farmer had purchased substrate from a farm supply store, but his seedlings did not develop nearly as well as the ones we could see in the nursery. The young farmer responded that he obtained the substrate from the embankment along the road in his property—a very low-cost approach. Erva-mate is a forest plant that is adapted to poor, acidic soils; thus, the corrected pH of commercial substrate is not suitable for erva-mate seedling production. Importantly, the researchers did not direct the discussion or provide instruction but listened, offering additional information or suggestions as equal participants in the discussion, thus creating the space for multiple voices to be heard and valued. In turn, these events and discussions began to consolidate a foundation on which the narrative network could be developed.

In November 2023, the GIAHS steering committee met with representatives of several communities and local institutions that are partners in the GIAHS candidacy to evaluate and adjust the DCAP based on the work outlined above. During the meeting, there was a renewed commitment to fostering the community of practice and narrative network locally and regionally, as it provides an important framework through which farmers recognize themselves and can engage and interact with the GIAHS program at multiple scales. This engagement is flexible and dynamic but with key community leaders and partners continually active in facilitating the exchange of knowledge and experiences across the network. Furthermore, a focus on listening and valuing different voices and experiences was reinforced to ensure that the activities outlined in the DCAP continue to have relevance to the farmers and communities that are the foundation of the candidacy. Both concepts are discussed further below in the context of the GIAHS program.

4. Discussion

4.1. Narrative Networks as Building Blocks for Agroecology and Conservation

The narratives produced through interviews, workshops, farms visits, and other interactions across the knowledge network are about life lived, embodied, and being lived in the countryside, which has its own geography, historicity, and feeling. By telling us about their farms, what, how, and why they produce, what their property was like in

the past, how the forest has changed, about the wild animals that used to be spotted and now no longer are (or vice versa), and what has happened to the rivers and streams, the erveiros tell us not only about environmental changes over time but also about the way in which they perceive the environment in which they live. Similarly, in dialogue with other farmers and technicians in the DCAP workshops, experiences, strategies, and embodied knowledges are exchanged and built upon, enabling new (or ancient) practices to come to light. When we consider the implications on daily life, such technical discussions can trigger subtle changes in cultivation and management practices. Most notably, they give rise to forms of dialogue that were non-existent, emerging as a result of social and collaborative engagement. In other words, the values and knowledge brought to light by erva-mate producers through narrative must be considered as systemic elements that are sometimes neglected or even disregarded by technical knowledge. Establishing a link between this knowledge requires building a bridge, a public space in which traditional knowledge can be validated and valued.

Within the broad conceptual spectrum of this participatory action research, the notion of shared authority plays an important role. Introduced by Frisch [42] in the context of public history, this concept is crucial to establishing a practical connection between oral history methodology and the construction of a narrative network around the GIAHS candidacy. Frisch emphasizes that, in both oral history and public history, there is no single authority, no single interpreter, and no single pre-eminent author. On the contrary, the process of interpretation and construction of meaning is intrinsically shared [42]. This implies that the production and dissemination of narratives is not subordinated to a single source of validation or authority. Instead, the process of interpreting and constructing meaning is collaborative and involves a diversity of perspectives and voices. This approach gains prominence when applied to the formation of communities of practice such as the GIAHS candidacy that are sustained through a narrative network.

The interviews, workshops, focus groups, and meetings conducted as part of our research and in developing and implementing the GIAHS candidacy show that these erveiros share feelings, perceptions, and subjectivities arising from their direct relationships with nature. It is in their interaction with the multiplicity of beings, elements, and dynamics of the forest that small-scale farmers and traditional and Indigenous communities form their environmental identity. And this identity merges with and is expressed in the landscape. It is in these forest remnants that they live and from which a large part of their income is derived.

The strong focus of the DCAP on communication is a clear indicator of the value of networks of knowledge and narrative to the communities involved and its importance for actions around environmental and cultural heritage. One of the major threats identified by all actors involved is the invisibility of these systems, the knowledge associated, and the socioenvironmental importance of traditional knowledge systems for the region and the world. This invisibility effectively prevents our IPLC partners from developing autonomy within the production chain (as their product is not recognized by industries or known by consumers), while simultaneously ignoring them in policy and other political discussions around conservation. A common theme throughout the workshops and dialogues is the need to raise awareness among themselves, consumers, and government/policy circles about these systems and their myriad benefits. But presenting economic or environmental data falls short, as it fails to capture the multi-faceted nature of these systems and their potential impact that goes well beyond conventional perceptions of economic, agricultural, or conservation models. In this context, narratives become a key point of communication, internally among farmers and local communities and externally to draw the attention of consumers and policy makers. Such a communication strategy ensures that the values, voices, and perceptions of local peoples are at the fore.

Thus, the shared narratives and environmental subjectivities provide the foundation on which local and regional actions like the GIAHS candidacy and DCAP can be developed, in that the narratives are recognized and familiar, creating a sense of belonging and

solidarity around shared challenges. The actions are not imposed; they are agreed upon and generative through narrative and dialogue.

One important aspect of this research and engagement is the length of interaction that some of the network members have with our partner communities. Relationships of trust take years of engagement and commitment to establish and are always fragile; misunderstandings and representational gaps can create problems and confusion. In this research, life trajectories intersect and diverge, bringing together people that may or may not have a history of working together for social and environmental rights. This strengthens ties but does not completely prevent conflicts. Mediation across the social and scientific aspects of Participatory Action Research that researchers are able to promote can sometimes be overestimated by local agents and by the researchers themselves. Often, this creates demands, expectations, and frustrations on both sides. The length of time that has passed since the first discussions with communities about this program in 2020 is an important example, as it has created expectations and impatience across the network. Focusing on what unites us and seeking to build solutions together to the challenges that reality imposes helps to address these issues.

4.2. Plurivocity in Agroecology and Conservation

In research and community engagement projects, such as that outlined here, the inclusion of multiple stakeholders is imperative. The plurality of voices and perspectives enriches historical and cultural understanding and ensures the implementation of practices that are relevant and truly reflective of local realities, while strengthening the identity of the communities involved. Although stakeholder engagement and consultation with local communities is frequently cited as part of conservation and agroecology methodologies [43], the actual process of valuing plurivocity and diverse epistemologies is complex and requires the breaking down of many dominant paradigms around research, engagement, conservation, agriculture, and colonial institutions, among many others. The process outlined here in building the GIAHS candidacy attempts to do just that by creating spaces and actions that are plurivocal, without simplifying actions to models that replicate the epistemicide [23] of conventional agriculture or conservation methods.

The multiple ways in which we have engaged with the communities and farmers that are partners in the GIAHS candidacy have shown us that growing up and living in the forest sharpens the senses. It modulates people's language and actions in an imbricated choreography of daily practice, ranging from caring for the farm, cleaning the house, and managing the vegetable garden to participating in family farming union meetings, community kitchens, and agroecological events, as well as helping to prepare an application for the GIAHS candidacy, among many others. Using simple, colloquial language, erveiros reveal in-depth knowledge of how nature and the forest works. There is communication between the erveiros and their natural world; as Lee and Newfont [44] (p. 3) point out, "this idea that the land speaks, that it has languages humans can hear, read, understand, and respond to, emerges from the interviews. It builds on a central tenet of environmental history: that nonhuman nature has agency, that it plays an active role in human affairs". Although we all have the ability to understand the "languages" of nature, like any language, we need time and dedication to become fluent and attuned.

However, academics and other stakeholders must learn and be open to incorporating and hearing these different languages, such as through narratives and storytelling [45]. In many scientific disciplines, farmers are still seen as mere beneficiaries of the knowledge produced in universities and other research centers; in other words, farmers should apply the knowledge and innovations developed by the "experts". Such approaches rarely consider the particular knowledge and experiences of farmers in their own environments. Thus, by reshaping the order of factors in favor of truly collaborative research and engagement, the process itself becomes a learning process—with the mistakes and successes that accompany it.

Tsing et al. [23] (p. S192) note in relation to small-scale family farmers' continuation of diverse productive systems in Southeast Asia: "Through their attention to economic crises and the alternative morphologies that emerge from human-plant-landscape relations, smallholders imagine critiques of dominant political economies. It is precisely this possibility of alternative ontological relations and plant morphologies that plantation simplifications [or monocultures] seek to deny". The epistemicide brought about by conventional agriculture erases these other ways of knowing and relating to the environment. Thus, we as researchers and practitioners must seek to unite our knowledge with theirs and develop dialogues about our different ways of knowing in order to build a more powerful narrative with greater resonance and acceptance in decision-making forums. If it is cultural and environmental diversity that sustains life on the planet, it is epistemic diversity [46] that we must invest in.

Through the public space of exchange embodied in the GIAHS candidacy, we are beginning to forge a creative and forward-looking narrative network that aims to strengthen the community of practice. By valuing the diversity of voices in a narrative consciously situated in the public space, this approach promotes communication for sustainability. It highlights and recognizes traditional practices of the utmost importance for environmental preservation and the continuity of local cultures. And in more practical terms, traditional knowledge, once confined to the specific experience of a single farmer, family, or community can circulate in the sphere of public encounters between peers and beyond. At the same time, it can incorporate the voices of researchers, political actors, and other technical professionals mobilized towards the common goals of agroecology, food security, and biodiversity conservation. This approach not only democratizes the process of knowledge production but also strengthens the basis for sustainability and the flourishing of traditional agricultural practices.

The focus on transdisciplinarity, multiple ways of knowing, and valuing local traditional and Indigenous knowledges is key to the co-production of knowledge and the dismantling of conventional power structures that are pervasive in academic, technical, and environmental research and conservation strategies [47]. In this sense, the inclusion of oral environmental and public history methodologies and practices has been essential to supporting a commitment to the shared authority of knowledge [48] in the GIAHS candidacy and the DCAP. Creating, communicating, and sharing public histories and narratives must remain true to those that have shared them but ensure that the knowledge remains within the realm of the local communities and not appropriated by academic or other actors.

Despite the challenges faced by erva-mate growers in the struggle to continue traditional systems, the engagement of the research team with the communities has produced positive and forward-looking movement. We believe that the results of the work presented here contribute to the valuing of traditional systems and can be used by communities to differentiate themselves in the market, not only through greater economic return but also by recognizing their ecological and socioenvironmental importance. Awareness and sensitivity to these processes helps younger people, for example, to envision a future with possibilities for innovation and renewal. Sharing common experiences articulated around these initiatives related to the GIAHS candidacy promotes the creation of ethical and empathetic listening channels, cultural mediation, and the co-production of knowledge, positioning this work at the intersection of public and environmental history, agroecology, and conservation.

Nevertheless, this is a new methodology with some limitations. While every effort was made to reach as many farmers and community members as possible, a greater participation of Indigenous and other traditional communities, such as Quilombolos, would provide further depth to the research. However, because of resource constraints and the fact that we are working across a large region of 11 municipalities, the outcomes are based on a sample of community members, and the narratives discussed herein represent the perceptions of those interviewed and who participated in the workshops and dialogues. Furthermore,

greater engagement with other actors across the value chain is necessary to begin to address some of the deep-rooted challenges and threats to these systems.

5. Conclusions

This paper focuses on the important role that oral environmental history and public history methodologies can play in developing and consolidating collaborative research and engagement networks focused on community-based environmental conservation systems and practices. Our long-term engagement with traditional agroforestry erva-mate producers in Southern Paraná offers a case study that demonstrates how integrating such approaches in conservation efforts enables the development of conservation action plans that are truly collaborative, with shared authority and based on shared identities and practices. We focus our analysis and discussion on the candidacy to obtain recognition as a Globally Important Agricultural Heritage System from the FAO and the development and implementation of the Dynamic Conservation Action Plan. The analysis of the process demonstrates how narrative networks and plurivocity can ensure that IPLCs are meaningful actors in the creation and implementation of conservation actions, so that such actions remain true to their cultural and socioenvironmental identities and practices, thus supporting long-term continuation and engagement.

The PAR activities, narratives, and discussions produced since 2017 have led to important developments among erva-mate producers and traditional communities in Southern Paraná. The shift in focus from purely analyzing erva-mate production or productive systems to a consideration of these systems as human-mediated has had significant implications for all researchers and community members involved. One of the most salient outcomes has been a recognition among the network that cultural and environmental heritage is a key aspect of these systems, their continuation, and forest conservation in the region. Through oral environmental histories, the narratives helped to bring to the fore the environmental subjectivities that permeate erveiros' interactions with the productive system, the forest, as well as wider actions related to forest conservation.

In order to address the challenges that traditional erva-mate producers face, particularly in terms of the advance of agrobusiness and neoliberal policies of high-yield commodity production, collaboration, community connection, and solidarity are necessary. In this sense, one of the most significant outcomes of the GIAHS project to date has been the creation of the foundation on which collective action and dynamic conservation can be built. The creation of a narrative network has been essential to building and implementing the GIAHS candidacy. The sharing and (re)creating of stories, histories, memories, subjectivities, and culture have been particularly effective in mobilizing people and building the community of practice. But this has required the sensitivity and openness of all involved in the process to the knowledge, experience, and position of others.

Erveiros, small-scale family farmers, and traditional and Indigenous community members are conscious political actors, aware of the importance of their work in feeding the population and maintaining their forested properties to provide ecosystem services. Yet, within the capitalist logic, they find themselves in the most vulnerable position. Their struggles for recognition are historic and representative of the social inequality that still characterizes Brazil and much of the Global South. Despite the fact that international organizations have recognized the importance of IPLCs in biodiversity conservation, they often remain outside of political negotiations and policy and program development [2]. As Arce-Nazario [16] (p. 153) pointedly reminds us, "the substance of . . . oral histories can remind us of the reasons why large, vocal, or empowered groups with abstract environmental goals do not carry forward all of the world's conservation efforts". Such efforts are often imposed, relying on (or demanding of) local networks and communities that are completely ignored in decision-making or implementation strategies.

Therefore, local networks of action focused on identities, narratives, and subjectivities are essential for the conservation of ecosystems in which humans are an integral part. But this does not mean that local, piecemeal action should be isolated as one-off case studies.

Connecting local actions to larger regional networks that include policy and government and international networks to build global communities of practice and narrative networks can further strengthen agroecology as a global movement and support local and Indigenous peoples as stewards of forests and agroecosystems.

Our efforts to build a GIAHS candidacy and put into practice the DCAP demonstrate the potential to build conservation efforts and public policies that are bottom-up, addressing the lived realities of those who are responsible for the conservation of agrobiodiversity and valuing the knowledge that plurivocity can bring. The environmental narratives produced in the context of traditional erva-mate production highlight a cultural model of nature [49] in which interaction with the environment intersects with historically constituted relationships of affect, community, labor, and power that connect people to the territory and situate and modulate their practices. By occupying new and historically restricted spaces, such as the GIAHS candidacy, and communicating their demands and concerns about preserving the environment in which they live, erveiro communities can mark their presence in the present and look to the future for the permanence of their way of life and their practices.

The intersection of environmental oral history, with public history, agroecology, and conservation is a new methodology that is still under construction. Nevertheless, the narratives produced through this research inscribe subjectivities that identify the forest and traditional systems as integral parts of the very existence and survival of the erveiros and their culture. Their ways of knowing, seeing, and interacting with environments that are particularly vulnerable to degradation, such as the remnants of the Araucaria Forest in Southern Brazil, offer alternative ways of doing conservation. The different environmental rationalities [50] that emerge from lived realities in specific contexts contain insights and solutions to similar problems faced by other groups in different places. Meanwhile, the experiences recounted demonstrate the importance of considering the dynamics and structures that challenge rural livelihoods and highlight the need to reimagine how local communities can play an integral role in this process. Documenting and circulating this local knowledge means presenting alternatives to the challenges that contemporary society imposes.

Author Contributions: All authors were involved in the conceptualization, methodology, formal analysis, writing, and editing of the original and revised drafts and project supervision. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded in part by the Social Sciences and Humanities Council of Canada (SSHRC), grant number 895-2015-1016; Embrapa Florestas, project number 161605002000; and the Ministério Publico de Trabalho do Paraná, project number PAJ 000628.2014.09.000/7.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to issues of participant confidentiality and agreed terms of use.

Acknowledgments: The authors are grateful to all the farmers, community members, and practitioners who participated in the interviews, workshops, and knowledge-sharing events and discussions that led to the development of the GIAHS candidacy.

Conflicts of Interest: The authors declare no conflicts of interest.

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