

Teacher Education in Countryside Public Schools Located in Municipalities Affected by the Fundão Dam Collapse: Contributions from the Articulation between Countryside Education Principles and Emerging Perspectives on Social Justice and Social Sustainability

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Abstract

The 2015 Fundão dam collapse, the largest socio-environmental disaster in Brazilian history, resulted in severe human, ecological, and socioeconomic losses across the Rio Doce Basin (IBAMA, 2015). Previous studies indicate that mining activities and the disaster were absent from regional school practices, a phenomenon conceptualized as "Pedagogical Silence" (Antunes-Rocha et al., 2021; Antunes-Rocha & Santos, 2024). In response, the Rio Doce School Program was established to provide continuing education for local public-school teachers. This postdoctoral study investigated the contributions of the specialization course offered by the Program to countryside school communities affected by the disaster (IBAMA, 2015). Driven by the theoretical-methodological framework of Countryside Education (Educação do Campo) alongside the premises of social justice and social sustainability (Sartoretto & Bergström, 2026), the research sought to understand the Program's contributions to overcoming Pedagogical Silence. Analytical parameters derived from the convergence of these theoretical matrices were applied to fourteen final monographs written by participating teachers. The findings demonstrate a strong synergy among the Program, Countryside Education, and principles of justice and sustainability, highlighting community mobilization toward the critical inclusion of the disaster into pedagogical projects, thereby indicating that the Program makes significant contributions to reflexive teacher education.

Introduction and Context

On November 5, 2015, the Fundão tailings dam collapsed in the municipality of Mariana, Minas Gerais, Brazil, releasing approximately 55 million cubic meters of iron ore mining waste into the Rio Doce River Basin. According to a report issued by the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA, 2015), the disaster caused extensive social, economic, and environmental damage, including the destruction of permanent preservation areas and native Atlantic Forest vegetation, widespread mortality of aquatic and terrestrial biodiversity, habitat loss and fragmentation, and the degradation of essential ecosystem services.

From an environmental perspective, approximately 98% of the Rio Doce River Basin lies within the Atlantic Forest biome, one of the world's twenty-five biodiversity hotspots and one of the most threatened ecosystems on the planet (IGAM, 2010, as cited in IBAMA, 2015). Beyond its ecological consequences, however, the disaster disproportionately affected countryside populations whose livelihoods depend directly on land-based production systems.

In this study, countryside populations are understood as communities whose social reproduction is organized around family-based agricultural labor and the use of land and natural resources for their subsistence and economic activities (Costa & Carvalho, 2012). As highlighted by Gonçalves, Pinto, and Wanderley (2016), family farmers in Mariana, Barra Longa, and other communities affected by the mining tailings experienced severe disruptions to their livelihoods, reinforcing the urgent need to

investigate and make visible the impacts experienced by countryside workers living in farming communities, settlements, and riverside areas.

The significance of these issues extends well beyond the Brazilian context. International studies have increasingly recognized countryside communities as key actors in addressing the global climate crisis because of the regenerative potential of their modes of production and social reproduction (Martínez-Alier, 2012; IPBES, 2024; Villamayor-Tomas & Muradian, 2023). At the same time, a growing body of literature has documented the threats posed by mining activities to these populations (Mármol & Vaccaro, 2020; Gustafsson, Rodriguez-Morales, & Dellmuth, 2022). Similarly, the European Parliament Report on the social and environmental impacts of mining activities identifies environmental degradation, ecological damage, water contamination, declining agricultural productivity, and food insecurity as major concerns, while emphasizing the socioeconomic consequences for affected populations (Mononen et al., 2022).

These dynamics are not unique to the Fundão disaster. Martínez-Alier (2012) argues that traditional countryside and Indigenous communities, despite demonstrating remarkable capacities for managing agricultural and agroforestry systems sustainably, remain particularly vulnerable to mining operations, oil extraction, large dams, deforestation, and industrial plantations. Paradoxically, these same communities have often been at the forefront of resistance to extractive development while offering viable alternatives for environmentally sustainable livelihoods.

Recent assessments by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) reinforce this perspective. Indigenous Peoples and local communities are responsible for a substantial share of global agricultural production while simultaneously conserving biodiversity within their territories. Nevertheless, they increasingly face pressures associated with mining, infrastructure expansion, resource extraction, environmental degradation, and climate change, all of which threaten their livelihoods, health, traditional knowledge systems, and capacity to conserve biodiversity.

Mármol and Vaccaro (2020) further argue that mining constitutes an inherently disruptive process capable of profoundly transforming both the sociocultural dynamics and the political economy of countryside territories. Although extractivism has traditionally been examined through experiences in the Global South, the expansion of mining activities in Europe has likewise intensified concerns regarding the sustainability of countryside regions, highlighting the need to broaden extractivism studies beyond their conventional geographical focus.

Within Brazil, family farming—the predominant form of agricultural production among countryside populations—accounts for 76.8% of agricultural establishments and employs approximately 67% of the country's agricultural workforce, despite occupying only 23% of the total agricultural land area (Aquino et al., 2022). This pattern is also observed across the Rio Doce River Basin, where family farming predominates in 35 of the 36 municipalities affected by the Fundão Dam collapse (Antunes-Rocha & Santos, 2024). Given their strong territorial ties and sustainable modes of production, countryside

communities possess significant potential to contribute to the ecological and social revitalization of the Rio Doce Basin, provided they receive adequate institutional support.

Since the disaster, the Study Group on Education, Mining, and the Environment (GEMA) has developed research and extension initiatives in collaboration with public-school systems across the affected municipalities. These studies consistently demonstrate that mining activities have generated substantial negative consequences for countryside communities, compromising both their livelihoods and their overall well-being (Antunes-Rocha & Santos, 2024; Jesus, 2025; Santos, 2025).

The group's earliest investigations also revealed a striking educational phenomenon. Although teachers working in schools directly affected by the disaster recognized its severity, they generally did not consider mining or the dam collapse appropriate topics for classroom discussion. Subsequent studies involving the remaining municipalities affected by the disaster identified the same pattern of educational silence (Antunes-Rocha & Santos, 2024). This systematic absence of critical engagement with mining and its consequences became known as Pedagogical Silence (Antunes-Rocha et al., 2021), a phenomenon characterized by the uncritical acceptance of the positive image promoted by mining corporations, the weakening of public debate concerning the disaster and its impacts, and limited awareness of both the social role of mining and the importance of public oversight of extractive activities (Hunzicker, 2019, 2024; Antunes-Rocha & Santos, 2024; Santos, 2025).

In response to these findings, GEMA launched, in 2021, the Extension Program Continuing Education for Public-School Educators in Municipalities Affected by the Fundão Dam Collapse in Minas Gerais, widely known as the Rio Doce School Program. Conceived as a compensatory educational initiative, the Program seeks to mitigate the consequences of the disaster by promoting Education for Revitalization, an approach grounded in the principles of socio-environmental education established by Brazil's National Environmental Education Policy (Law No. 9,795/1999). According to this legislation, environmental education comprises the processes through which individuals and communities develop values, knowledge, skills, attitudes, and competencies aimed at environmental conservation, the promotion of quality of life, and sustainable development.

Building upon the National Curriculum Guidelines for Environmental Education established by the National Education Council in 2012, the Program recognizes schools as strategic institutions capable of influencing their surrounding communities over the short, medium, and long term. Rather than focusing exclusively on environmental restoration, however, the Rio Doce School Program adopts a broader and more critical perspective by integrating three interconnected themes throughout its educational activities: mining, the Fundão Dam collapse, and the revitalization of the Rio Doce River Basin. Through participatory methodologies, educators are encouraged to engage critically with these issues while mobilizing school communities to participate actively in socio-environmental revitalization processes.

The Program also responds directly to recommendations presented by IBAMA (2015), particularly the need to generate reliable knowledge concerning secondary environmental impacts, evaluate the effectiveness of restoration initiatives, and promote public engagement in environmental recovery. In this

sense, the Program seeks not only to strengthen environmental awareness but also to foster a critical repositioning of local communities in relation to their territories, natural resources, and broader socio-environmental responsibilities.

The present article, based on postdoctoral research, evaluates the contributions of the Rio Doce School Program to the education of teachers working in countryside public schools, focusing on their capacity to promote critical reflection on mining, the Fundão Dam collapse, and the revitalization of the Rio Doce River Basin.

More specifically, the study addresses three central research questions: (1) How has the Program contributed to overcoming Pedagogical Silence? (2) How do the principles of the Brazilian Countryside Education movement support the theoretical interpretation and methodological reflection of this teacher education process? (3) How can the concepts of social justice and social sustainability contribute to the construction of analytical parameters for evaluating the Program? To answer these questions, the study analyzes the final projects produced in the Program's graduate specialization course through the analytical lens provided by the principles of Countryside Education, in dialogue with emerging theoretical perspectives on social justice and social sustainability synthesized in the scoping review conducted by Sartoretto and Bergström (2026).

2. The Rio Doce School Program and the Graduate Specialization Course

In 2016, the Popular Brazil Project (Projeto Brasil Popular) was established as a national initiative aimed at fostering debate on a democratic, sovereign, and socially inclusive development project for Brazil. The initiative was grounded in the premise that improving people's living conditions depends fundamentally on the country's economic, political, cultural, and environmental development model. It advocates a development strategy rooted in a more equitable distribution of wealth, democratic participation in public decision-making, and social justice.

The Project comprises thirty-one thematic working groups, one of which—the Mining Working Group—was created to formulate an alternative model for the Brazilian mining sector founded on the principles of popular sovereignty and the recognition of the broad range of social, environmental, and economic impacts generated by mining activities (Alves et al., 2020).

Within the discussions promoted by the Mining Working Group, particular attention has been devoted to the relationship between education and mining. The group argues that mining corporations have increasingly influenced educational systems by shaping curricular content, pedagogical methods, and public narratives, especially within the field of environmental education (Alves et al., 2020). Such initiatives tend to promote an individualized understanding of environmental responsibility while reinforcing the public image of mining companies as environmentally responsible actors. In contrast, the Working Group advocates the incorporation of mining into school curricula through a critical environmental education perspective capable of encouraging collective reflection on the nature of

extractive activities, their socio-environmental consequences, and the need for democratic governance and public oversight of the mining sector.

In dialogue with this perspective, the Rio Doce School Program developed its theoretical and methodological framework around six guiding principles:

1. the integration of alternating learning spaces and times;
2. teacher education grounded in participants' social realities and territorial contexts;
3. curriculum organization based on Integrating Themes;
4. the articulation of theory, research, and educational practice;
5. the documentation, systematization, and dissemination of knowledge generated throughout the educational process; and
6. democratic management.

The Program seeks to prepare teachers within a socio-environmental education framework by incorporating the Integrating Themes into educational projects that address concrete problems experienced by local school communities. Within this framework, revitalization constitutes one of the Program's central conceptual dimensions.

According to the Agreement for Conduct Adjustment (Termo de Ajustamento de Conduta, 2016), revitalization is understood as the process of restoring the vitality of a territory conceived as an integrated socio-ecological system, creating favorable conditions for harmonious relationships between human societies and nature while considering the socioeconomic realities of each locality as a foundation for sustainable development.

Following the guidelines established by the TTAC, the Program initially offered a Professional Development Course to all Basic Education teachers working in public schools across the municipalities affected by the Fundão Dam collapse in Minas Gerais. The first cohort enrolled 2,828 teachers representing all thirty-six affected municipalities. Of these, 2,596 successfully completed the course, corresponding to a completion rate of 91.8%. The second cohort enrolled 1,659 participants from thirty-five municipalities, of whom 1,495 completed the program, resulting in a completion rate of 89.8%. Altogether, the two cohorts graduated 4,091 teachers. Participants represented approximately six hundred public schools distributed throughout the Rio Doce River Basin, corresponding to nearly all of the 616 schools identified by the 2023 Brazilian School Census.

Building upon this experience, the Program subsequently offered a Graduate Specialization Course designed to prepare 122 educational specialists distributed throughout the Rio Doce River Basin. These specialists were expected to support schools in developing Experimental School Pedagogical Projects centered on the interconnected themes of mining, the Fundão Dam collapse, and the revitalization of the Rio Doce River Basin. Through the implementation of these projects, participants worked collaboratively

with school communities to incorporate the Integrating Themes into each school's Political-Pedagogical Project, thereby strengthening the institutionalization of critical socio-environmental education.

To achieve this objective, participants in the Specialization Course were assigned to 520 public schools that voluntarily joined the Program. During the Professional Development Course, teachers conducted social mapping activities within their school communities to identify locally relevant Integrating Themes and subsequently designed and implemented classroom teaching sequences rooted in these findings. In the Graduate Specialization Course, participants revisited these earlier experiences while working alongside school communities to develop School Pedagogical Projects and discuss the incorporation of the Integrating Themes into each school's Political-Pedagogical Project.

From a curricular perspective, the Integrating Themes were incorporated across multiple disciplines and educational levels, promoting interdisciplinary approaches to environmental education and socio-environmental sustainability. Schools progressively integrated these themes into their Political-Pedagogical Projects, thereby strengthening the transversal character of environmental education within the curriculum.

The Program's proposal for revitalization is closely aligned with the responsibilities assigned to educational institutions under Brazil's National Environmental Education Policy (Law No. 9,795/1999), particularly the responsibility to promote environmental conservation and sustainable development. Likewise, it reflects the National Curriculum Guidelines for Environmental Education (Brazil, 2012), which recognize schools as institutions capable of influencing their surrounding communities and contributing to environmental transformation. Consequently, the Program understands the revitalization of areas degraded by the Fundão Dam disaster not only as a process of ecological restoration but also as one of environmental monitoring, community engagement, and the co-production of knowledge alongside local populations.

The pedagogical organization of the Graduate Specialization Course was inspired by the principles of the Pedagogy of Alternation, an educational approach that integrates different learning spaces and temporalities into a coherent formative process. Within this framework, participants alternated between the University Time (Tempo Universidade) - dedicated to planning, theoretical study, collaborative reflection, and preparation - and the Community Time (Tempo Comunidade), during which fieldwork, community engagement, data collection, observation, and collaborative work with schools were carried out.

This pedagogical model required both rigorous academic preparation and continuous guidance regarding the activities to be implemented between university meetings. Participants assumed the role of researchers of their own realities, documenting and systematizing local experiences while producing knowledge grounded in the concrete conditions of their territories.

The methodological approach also draws upon Paulo Freire's concept of the human vocation to "be more" (*ser mais*), emphasizing education as a fundamentally dialogical process whose ethical

implications include solidarity, collective responsibility, and commitment to the emancipation of oppressed and affected populations. Consequently, dialogical and participatory methodologies—hallmarks of democratic educational practice—became central analytical dimensions for evaluating the Program's educational outcomes (Freire, 1968).

Given the Program's commitment to mobilizing school communities in support of the revitalization of the Rio Doce River Basin, this study adopts the theoretical articulation between social justice and social sustainability as the main framework for building analytical parameters capable of evaluating the Program's contributions to teacher education. Specifically, it draws upon the scoping review conducted by Sartoretto and Bergström (2026), which synthesizes contemporary trends concerning the relationship between these two concepts and provides the theoretical foundation for the analytical framework developed in this article.

3. Contributions of the Articulation between Social Justice and Sustainability to Critical and Emancipatory Educational Processes

In a scoping review, Sartoretto and Bergström (2026) sought to understand how the academic literature published between 2018 and 2023 conceptualizes social justice in relation to social sustainability. According to the authors,

while social justice is an established and well-grounded concept in political theory and political philosophy, with a historical tradition of at least 150 years, its relationship with social sustainability remains only superficially established, particularly considering the limited number of articles and book chapters (25 over a five-year period) addressing this relationship (Sartoretto & Bergström, 2026).

The authors argue that, although the notion of sustainability remains somewhat vague and weakly engaged, there are emerging trends advocating radical transformations in the ways discussions and practices concerning social sustainability can promote social justice. These trends conceive social justice as a transdisciplinary concept applicable to fields such as education, with a strong emphasis on redistributive processes. Four emerging themes were identified in the literature concerning the relationship between these concepts: situated justice, dimensions of social sustainability, political dimensions of social justice, and equity relations.

The authors also identify three areas as particularly promising for theoretical development and public debate concerning the dialogue between social justice and sustainability:

the expansion and deepening of the mobilization of social justice in applied fields; increased attention to the collective and community dimensions of social justice; and consideration of the material conditions within the contexts in which actions promoting social justice and social sustainability emerge (Sartoretto & Bergström, 2026).

Approximations between the Concepts of Social Justice and Social Sustainability

The authors approach social justice from the perspective of the equitable distribution of material, symbolic, and environmental resources. Social justice is understood as a multifaceted concept that may be characterized as **procedural**, **distributive**, **retributive**, or **restorative**, with procedural and distributive justice being the most frequently employed approaches in the literature reviewed. Distributive justice concerns the fair allocation of resources and the evaluation of distributive outcomes, treating equals equally and unequals proportionally according to their needs or merits. Equity theory constitutes one of the main theoretical models within distributive justice, focusing on both the content of distributions and the fairness of their outcomes (Silva et al., 2026). Procedural justice, in turn, emphasizes the existence of commonly accepted rules governing the distribution of outcomes.

In discussing social justice, the authors draw upon different theoretical traditions to construct an interpretive framework that underpins their scoping review. For the purposes of this article, we emphasize two major references: the perspective of intersectionality, developed by Collins and Bilge (2020), and Arturo Escobar's perspective on Pluriversal Politics.

Collins and Bilge (2020) argue that social inequality is not distributed evenly across society but instead disproportionately affects marginalized groups.

Rather than seeing people as a homogeneous, undifferentiated mass of individuals, intersectionality provides a framework for explaining how categories of race, class, gender, age, and citizenship status, among others, position people differently in the world (...). Intersectionality brings a framework of intersecting social inequalities to economic inequality as the measure of global social inequality (Collins & Bilge, 2020, p. XX).

Since the 1990s, economic inequality in terms of income and wealth has increased exponentially across most countries, affecting approximately 70% of the world's population, while half of global wealth has become concentrated in the hands of just 1% of the population. Collins and Bilge (2020) refer to the World Inequality Report (2018), which argues that *"this increase in inequality marks the end of a postwar egalitarian regime which took different forms in these regions."* Beyond the category of class, the concept of intersectionality incorporates additional variables that shape the production of economic inequality, thereby supporting the development of more effective social policies to confront inequity.

The concept of intersectionality refers to the ways in which multiple social categories interact in shaping power relations across societies and individuals' everyday experiences. As an analytical framework, intersectionality considers categories such as race, class, gender, sexuality, nationality, ability, ethnicity, and age, among others, examining how these categories interact and mutually redefine one another. It reveals systems of power distribution and the production of inequities, rooted in lived experiences and situated knowledge, thereby highlighting the specificity of these relationships and experiences.

The authors also emphasize the contributions of **critical education** from an intersectional perspective, highlighting its potential to foster identity formation. They argue that *"Globally, critical education has long been aligned with intersectionality's critical inquiry and praxis"* (Collins & Bilge, 2020, p. 189), identifying in

Paulo Freire's seminal work *Pedagogy of the Oppressed* (1968) a strong convergence between intersectionality and critical education. According to the authors,

While not typically categorized this way, this book constitutes a core text for intersectionality. Freire rejects a class-only analysis of power relations in favor of the more robust power-laden language of the 'oppressed'. The oppressed of Freire's twentieth-century Brazil are similar to those oppressed of today (...). Freire's use of the terms 'oppression' and 'oppressed' invokes intersecting inequities of class, race, ethnicity, age, religion, and citizenship. Via his choice of words, Freire links the needs of oppressed people to calls for social justice. (Collins & Bilge, 2020, p. 190).

According to Collins and Bilge (2020), the development of critical consciousness rooted in both individual and collective identities can play a transformative role in reshaping existing power structures.

Another reference highlighted by Sartoretto and Bergström (2026) is Arturo Escobar's *Pluriversal Politics* (2020). In this work, Escobar responds to the resurgence of right-wing movements against progressive governments and seeks to recover Latin American Critical Thought (LACT) as an alternative to Western universalist epistemology.

Reconstructing the historical trajectory of LACT, Escobar identifies its earliest critiques of Eurocentric knowledge in Orlando Fals Borda's *A Science of Our Own and Intellectual Colonialism* (1970) and Paulo Freire's *Pedagogy of the Oppressed* (1968). According to Escobar, both authors profoundly challenged the epistemic foundations of the political left and anticipated what is now referred to as "other ways of knowing", thereby contributing to the recognition of subaltern worlds.

The popular education and communication movements inspired by Fals Borda (with his "participatory action research" program) and Freire (with his "consciousness-raising" pedagogy) led to countless transformative protests and demonstrations in the 1970s and 1980s, often on the part of revolutionary struggles fueled by Marxism and the whole range of the Left, but always emphasizing the need to take people's ways of knowing seriously. (Escobar, 2020, p. 34).

Escobar therefore asks what Latin American Critical Thought represents today. He argues that it is not in crisis but rather more vibrant and dynamic than ever, owing to the active participation and resistance of a wide diversity of social collectives. Within this perspective, social justice is understood not merely as the redistribution of resources but also as the recognition of these communities' specificities and the attribution of autonomy for them to reimagine the world. Escobar thus advocates **epistemic and ontological justice**, emphasizing the interdependence among all living beings.

Building upon these theoretical perspectives, Sartoretto and Bergström (2026) argue that the empirical studies identified in their scoping review, despite revealing limited theoretical elaboration on social justice, nevertheless demonstrate a broad consensus regarding the relevance of social justice principles for evaluating social sustainability.

The scoping review also identified four recurring themes based on the frequency of analytical categories across the selected studies: **situated social justice**, **dimensions of social sustainability**, **political dimensions of social justice**, and **equity relations**.

Situated social justice emerged as the most frequent theme, appearing in twenty-two of the twenty-five studies reviewed. It is characterized by a concrete territorial grounding that recognizes local communities both as rights-bearing subjects and as potential agents in shaping policies for their own territories. The review identifies categories such as community participation, resistance to hegemonic regulatory models, the relevance of local initiatives, and critiques of the lack of research devoted to these contexts as central elements for understanding situated social justice.

The **political dimensions of social justice** in relation to sustainability were identified in fourteen of the twenty-five studies. These studies reveal that unequal access often results from depoliticized understandings of sustainability. Empirical examples demonstrate that the benefits associated with sustainability tend to favor privileged social groups, frequently justified by prejudiced assumptions that attribute disinterest or lack of knowledge about sustainability to lower-income populations.

The **social sustainability** dimension appeared in thirteen of the twenty-five studies, revealing a recurrent overlap and conceptual indistinction among the terms *social justice*, *social sustainability*, and *equity*. Beyond this conceptual convergence, the most frequently discussed themes include environmental dimensions, health and safety concerns, and ethnic and racial issues.

Finally, the theme of **equity relations**, identified in twelve of the twenty-five studies, reinforces the distributive dimension of social justice in relation to social sustainability. In general, these studies advocate the articulation of four interconnected issues: equity as a prerequisite for sustainable societies; sustainable development as inseparable from confronting global inequities; the relationship between social equity and environmental issues; and questions of social justice within economically developed countries. The review also highlights the scarcity of research on social sustainability in countryside contexts.

Sartoretto and Bergström (2026) identify three particularly promising directions for advancing theoretical development and public debate aimed at incorporating principles of social justice into sustainability studies. First, mobilizing the concept of social justice within applied fields such as education may generate more practical outcomes in terms of social impact and public policy recommendations. Second, increasing scholarly attention to the collective and community dimensions of social justice favors the emergence of new forms of collective action. Third, because these collective actions materialize in specific places, their territorial conditions must be considered when promoting both social justice and social sustainability.

One of the trends identified in the scoping review is the **transdisciplinary** character of social justice, within which education assumes a particularly relevant role, closely associated with the notion of situated social justice:

Some empirical studies discuss education (#19, 23 and 28) as a domain of social justice in the sense that access to quality education is an indicator of social justice, whereas others regard educational institutions and pedagogical practices as means of mobilizing knowledge about social justice (Sartoretto & Bergström, 2026, authors' translation).

Accordingly, although the general notion of sustainability remains relatively vague and weakly engaged, current trends point toward profound transformations in the ways discussions and commitments concerning social sustainability can promote social justice. The trends identified in the scoping review reveal an initial convergence with the principles underpinning the **Countryside Education Movement (Educação do Campo)**, which are presented in the following section.

4. Toward a Basic Countryside Education

This section aims to present the guiding principles of the Countryside Education Movement (Educação do Campo) that served as the theoretical and methodological foundation for the Rio Doce School Program. These principles are then examined alongside the emerging themes identified by Sartoretto and Bergström (2026) concerning the articulation between Social Justice and Social Sustainability, thereby establishing the analytical framework employed in the examination of the Graduate Specialization Course final papers.

The Countryside Education Movement emerged from the popular mobilization of countryside workers during the 1980s, seeking to secure basic rights, particularly the rights to land and education. The expression *Educação do Campo* ("Countryside Education") was officially adopted during the First National Conference for a Basic Countryside Education, held in 1998, as a means of distinguishing itself from the traditional concept of rural schooling while emphasizing the protagonism of countryside peoples. The background document prepared for this Conference remains the principal reference regarding the movement's conceptual foundations, principles, and historical context, and may therefore be regarded as the foundational landmark of the Countryside Education Movement (Caldart, 2012). Although the movement has achieved important advances and its demands have evolved over time, its fundamental principles remain highly relevant today.

The foundational document of the First National Conference for a Basic Countryside Education is grounded in a critique of the exclusionary character of a development model rooted in urban-industrial expansion, whose most evident social consequences included uncontrolled rural-to-urban migration and the emergence of marginalized populations seeking recognition of their own ways of producing and reproducing life.

The Conference sought to formulate an alternative model of development in which education would play a central role. Accordingly, the background document defines education as

human formation that builds cultural and political references enabling individuals and social subjects to intervene in reality, aiming toward a fuller and happier humanity (Fernandes et al., 1998, pp. 23–24).

The document advocates a high-quality public education oriented toward the interests of countryside peoples, recognizing basic education at all educational levels as a fundamental right and a responsibility of the State. It also acknowledges that non-formal educational experiences constitute an essential reference for Countryside Education.

More specifically, the Countryside Education Movement identifies peasant labor - through food production, the reorganization of work, cooperative and sustainable production, and its historical forms of resistance - as the defining characteristic of countryside ways of life, encompassing Indigenous peoples and Quilombola communities alike. These groups are therefore recognized as fundamental references for building an alternative countryside development project. From this perspective, the movement considers agrarian reform and agricultural policies indispensable for strengthening peasant communities.

The role of Countryside Education is consequently to reinforce these ways of life and their identities so that they may resist the industrial model of agricultural production while guaranteeing pluralism in pedagogical ideas and educational practices. When characterizing the countryside context, the background document portrays a development model marked by inequality and exclusion, which has promoted rural flight, weakened local identities, and reflected the historical neglect of peasant populations by public authorities.

In response to this reality, the document proposes a popular national development project founded upon commitments to sovereignty, solidarity, development, sustainability, and an expanded conception of democracy. It argues that such a project requires valuing peasant populations and their cultural heritage while promoting a redistributive and participatory model of development.

Regarding countryside territories specifically, the document argues that development should likewise be conceived within this framework. It recognizes family farming as a central component of countryside development because of its capacity to generate employment, produce food, distribute income throughout the economy, and improve the living conditions of peasant populations. Consequently, the movement advocates recognition of the protagonism of family farmers, the implementation of agricultural policies aimed at food security, the advancement of agrarian reform, incentives for sustainable, equitable, and agroecological farming practices, and policies that support both the processing and commercialization of family-farming products. These initiatives should be accompanied by broader social development programs encompassing education, healthcare, housing, public services, and leisure.

As a result of sustained struggles by peasant movements, many of the demands for public policies concerning basic countryside education originally presented in the foundational document have gradually been addressed and, in some respects, surpassed (Molina & Antunes-Rocha, 2014; Esmerado et al., 2017; Brasil, 2025). Therefore, revisiting these policy achievements lies beyond the scope of the present article.

It is therefore evident that the principles articulated in the foundational document closely dialogue with the critical perspectives advanced by Collins and Bilge (2020), particularly regarding the recognition of multiple forms of oppression and the development of critical consciousness rooted in individual and collective identities as a means of transforming existing power structures. Likewise, these principles converge with Escobar's (2020) critical perspective, which recognizes the revolutionary potential of emerging critical movements within Latin American Critical Thought and values diverse forms of knowledge and relationships with the world.

Moreover, they are closely aligned with the emerging themes identified in recent literature linking Social Justice and Social Sustainability, as synthesized by Sartoretto and Bergström (2026): situated justice, dimensions of social sustainability, political dimensions of social justice, and equity relations. Building upon this dialogue among theoretical perspectives, the following section develops the analytical parameters that integrate the concepts of Social Justice and Social Sustainability.

5. Developing Analytical Parameters for the Educational Practices of the Rio Doce School Program

The studies conducted by NEPCampo (Center for Research on Countryside Education), at the School of Education of the Federal University of Minas Gerais (FaE/UFMG), have sought to systematize the theoretical foundations and guiding principles of the Countryside Education Movement, taking the foundational document *Toward a Basic Countryside Education* as their principal reference. Within this context, Antunes-Rocha and Justino (2022), after examining the educational experience of the Escola da Terra Program implemented at UFMG between 2015 and 2019, concluded that:

The first challenges originated from the purpose of adopting Countryside Education as the formative matrix of the course. Taking Countryside Education as the organizing framework for teacher education required reflecting on how to translate the principles, concepts, and practices developed by the Countryside Education Movement since 1998 into a coherent set of procedures and instruments capable of ensuring the cohesion and consistency of the educational process. (Antunes-Rocha & Justino, 2022, p. 18).

From the same perspective, the experience accumulated by NEPCampo constitutes the starting point for analyzing the educational practices developed within the Rio Doce School Program, whose theoretical and methodological foundations are rooted in the principles of the Countryside Education Movement. The analytical parameters developed by NEPCampo and systematized by Freitas (2021) were compared with the four emerging themes identified in the scoping review conducted by Sartoretto and Bergström (2026)—namely situated justice, dimensions of social sustainability, political dimensions of social justice, and equity relations.

The development of these analytical parameters contributes both to theoretical advancement and to public debate concerning the incorporation of principles of social justice into sustainability studies and the Countryside Education Movement. In doing so, it encompasses the three areas identified by Sartoretto and Bergström (2026) as particularly promising:

the expansion and deepening of the mobilization of social justice in applied fields; increased attention to the collective and community dimensions of social justice; and consideration of the material conditions within the contexts in which actions promoting social justice and social sustainability emerge.

The underlying assumption is that analyzing the educational experiences of teachers working in countryside schools who participated in the Graduate Specialization Course through the principles of Countryside Education may contribute to the development of public policies as well as to systems for evaluating and monitoring teacher education programs.

Based on the systematization of these analytical parameters, the educational practices developed within the Graduate Specialization Course of the Rio Doce School Program and their impacts on fourteen countryside schools affected by the Fundão Dam collapse were examined. Documentary research was adopted as the methodological approach, focusing on four Graduate Specialization Course final papers.

The first analytical indicator proposed by Freitas (2021) is Education as a Right. From critical educational perspectives, the right to education constitutes a prerequisite for the comprehensive development of individuals and for the transformation of society through alternatives to conventional educational models. Within the historical context of the Countryside Education Movement, the right to education represents one of its foundational pillars, given the longstanding absence of educational policies directed toward countryside peoples. This principle seeks to guarantee high-quality educational provision at all educational levels and modalities.

The descriptors proposed by Freitas (2022) encompass the essential conditions required in basic education schools - conditions that have not always been guaranteed by the Brazilian public education system - and were achieved through the political struggles of the Countryside Education Movement. These descriptors include the specific characteristics of Countryside Education, policies for teacher education, and the production of teaching materials developed through the movement's collective efforts. Accordingly, the first indicator evaluates equity in Countryside Education through compliance with both general educational regulations and those specifically addressing Countryside Education.

The second indicator concerns education for sustainable countryside development. Unlike the previous indicator, this dimension was not included among the analytical parameters originally developed by NEPCampo, which instead proposed the indicator "School Project Linked to a Countryside Development Project." Its descriptors reinforce the fundamental principles of the Countryside Education Movement, including the defense of land ownership and land use rights - whose historical starting point was agrarian reform - the recognition of family farming as the principal means through which peasant communities produce and reproduce life, and the need to address rural succession, widely identified in the literature as one of the main challenges to maintaining peasant modes of production.

The inclusion of sustainability reflects the growing global recognition of the importance of traditional peoples' ways of life in addressing the climate crisis, particularly because of their balanced relationships with nature and biodiversity (IPBES, 2024). Consequently, this indicator is fully aligned with one of the

central principles of the Countryside Education Movement: the construction of an alternative development project for rural territories, in opposition to the economically driven and environmentally predatory model associated with large-scale extractive enterprises.

The third indicator is based on the ontological perspective shared by critical educational theorists, who understand human development as requiring the active participation of learners through praxis. Within this perspective, educational action emerges through collective processes that encourage individuals to reflect critically upon their own realities and to transform situations of oppression.

Protagonism, as opposed to the assumptions of oppressive education and its individualistic, exclusionary, and competitive principles, is guided by humanistic values such as solidarity, collective action, and the integrated development of both individuals and their communities, always oriented toward the common good.

The descriptors associated with this indicator address two complementary dimensions of the educational process. The first concerns the participation of students and other members of the school community in organizing school life and implementing educational actions directly connected to community needs. This requires continuous dialogue with the school community, collaborative planning around locally relevant themes, and initiatives that strengthen both community identity and traditional ways of life.

The second dimension concerns the self-organization of the school community as a means of promoting social transformation aligned with community interests. Such self-organization constitutes an important analytical parameter for assessing collective engagement, solidarity, and the emergence of local leadership.

Although education for protagonism presupposes the active participation of all members of the school community and recognizes this participation as formative for everyone involved, the primary mission of Countryside Education remains the comprehensive development of students. Accordingly, academic learning, technical and scientific knowledge, student participation in school activities and projects, and the implementation of these projects should all be assessed as continuous educational processes. Only under these conditions can education truly be understood as **integral education**.

Table 1

Transition to the Results

Rooted in this analytical framework, the study examined the four Graduate Specialization Course final papers produced by teachers participating in the Rio Doce School Program. Document analysis sought to identify how the educational practices developed in rural schools reflected the principles of Countryside Education and the emerging themes associated with Social Justice and Social Sustainability. The analysis therefore focused on the extent to which these educational experiences

promoted educational rights, sustainable countryside development, collective protagonism, and integral human development within communities affected by the Fundão Dam collapse.

General Evaluation of the Data

In an initial assessment of how the indicators and descriptors appear within the categories "training processes" and "school educational practices" described in the Graduate Specialization Course final papers, the most frequently identified descriptor was "Democratic participation of students, families, and the community in the planning, organization, and implementation of the school's pedagogical and administrative proposals", which appeared 26 times. This was followed by two descriptors that each appeared 24 times: "Political awareness" and "Curriculum aligned with the realities of countryside life". The fourth most frequent descriptor was "Educational practices contextualized to countryside realities", identified 23 times, followed by "Pedagogical support", which appeared 17 times.

These descriptors are closely related to both the organization of the Graduate Specialization Course final papers and the nature of the Rio Doce School Program/Graduate Specialization Course, since the methodological guideline for preparing the final papers required participants to produce an experience report describing the interventions carried out in the schools. Within the Graduate Specialization Course proposal, these interventions emphasized dialogue with schools and continuous institutional support, guided by instructional materials and academic supervision provided by university faculty, who directed participants in the implementation of specific educational activities.

It is therefore unsurprising that Democratic Participation appeared far more frequently in the category Training Processes (22 occurrences) than in Educational Practices (4 occurrences), as it primarily characterized the organizational processes that defined the Program's and the Course's methodological approach.

With a more balanced distribution between the two categories (16 occurrences in Training Processes and 8 in Educational Practices), the descriptor Political Awareness reflects not only the principles, methodology, and instructional materials developed for the Graduate Specialization Course and the Rio Doce School Program, but also the participants' own engagement throughout the activities. As Oliveira (2026b) states:

"The critical awareness fostered through dialogue circles culminated in the collective development of intervention proposals (Experimental School Pedagogical Projects), demonstrating that dialogical listening is both a viable and powerful tool for transforming the disaster into an object of critical knowledge" (Oliveira, 2026b, p. 37).

The adoption of the triad mining, the Fundão Dam collapse, and watershed restoration as the Program's Integrating Themes sought to make mining visible, critically examine the dam failure, and raise awareness among schools—particularly rural schools—of their role in the revitalization of the Rio Doce watershed. This thematic approach presented a significant challenge for participants, generating initial

resistance due to its novelty and the absence of previous educational references within the public school system. Consequently, the instructional materials aimed to provide conceptual clarification regarding these themes, while the adopted methodology encouraged dialogue and territory-based research in order to overcome the phenomenon of Pedagogical Silence (Antunes-Rocha et al., 2021) and foster political awareness. The balanced occurrence of this descriptor in both Training Processes and Educational Practices indicates that one of the Program's main objectives was successfully achieved.

The descriptor Pedagogical Support emerged within this same educational context, as participants—under the academic supervision of university professors—implemented interventions in schools aimed at critically reflecting on existing educational practices concerning these themes. Together with school communities, they collectively assessed the relevance of the topics and proposed their incorporation into the school's Political-Pedagogical Project as well as into the Experimental School Pedagogical Projects.

Beyond merely reporting completed activities, the presence of these descriptors throughout the Graduate Specialization Course final papers demonstrates concrete outcomes resulting from the collaborative work developed with participating schools. The following excerpts illustrate these findings:

"...schools begin to adopt practices that strengthen contextualization and situated learning, enabling students to recognize themselves as rights-bearing subjects and producers of knowledge. Thus, the active methodologies implemented—such as dialogue circles, thematic video screenings, interviews with community members, and analyses of local issues—function as educational devices that foster autonomy, critical thinking, and student protagonism. In this way, interdisciplinarity and active methodologies complement one another, enhancing the pedagogical potential of territory-based learning and making the educational process more meaningful and socially grounded." (Drumond, 2026, p. 46)

"The implementation of the Rio Doce Watershed School Program emerges as a critical, place-based educational alternative capable of reinterpreting the Sustainable Development Goals (SDGs) in light of the socio-environmental specificities of the Rio Doce watershed. Unlike global policy frameworks that often overlook Brazil's historical inequalities and economic dependency, the Experimental School Pedagogical Projects propose a pedagogical approach rooted in Critical Environmental Education and emancipatory principles, integrating ecological restoration with citizenship education. Inspired by Freirean principles of dialogue and conscientization (Freire, 1996), the Program promotes the integration of school, community, and the environment, transforming the territory into a space for learning and social mobilization. In this perspective, the school becomes the locus for addressing the community's social demands." (Oliveira, 2026a, p. 88)

In this regard, the Graduate Specialization Course final papers provide a substantial body of evidence, documentation, and bibliographic references demonstrating how countryside communities throughout the Rio Doce watershed were—and continue to be—affected by both the Fundão Dam collapse and mining activities across different municipalities.

"Following the environmental disaster caused by Samarco S.A., the main economic activities in Territory 05—including fishing, agriculture, and tourism—were interrupted as a result of contamination of the Rio Doce. Small-scale farmers lost fertile land, while fishers lost their livelihoods due to fish mortality and water pollution. Local businesses dependent on these productive activities also experienced significant economic losses, aggravating unemployment and accelerating rural outmigration." (Oliveira, 2026a)

These findings reinforce the premise that the educational proposals developed within the Rio Doce School Program extend beyond curricular innovation. Rather, they constitute strategies for territorial reconstruction by connecting critical environmental education with community participation and local development.

The analysis of the four Graduate Specialization Course final papers further indicates that the Program successfully promoted the incorporation of the Integrating Themes into school pedagogical practices. The pedagogical interventions were consistently characterized by dialogue with local communities, collective planning, interdisciplinary work, and the recognition of local knowledge as an essential component of educational practice.

From the perspective of the analytical framework adopted in this study, these findings demonstrate a strong convergence between the principles of **Countryside Education**, the emerging concepts of **Social Justice** and **Social Sustainability**, and the educational methodology implemented by the Rio Doce School Program. The educational experiences analyzed consistently emphasized democratic participation, contextualized learning, collective engagement, and the strengthening of community identity, thereby contributing to overcoming the **Pedagogical Silence** previously identified in schools affected by the Fundão Dam disaster.

Moreover, the evidence suggests that the Program fostered conditions for schools to become active agents in the socio-environmental revitalization of their territories. Rather than merely transmitting knowledge about the disaster, educational activities encouraged teachers, students, and community members to critically interpret their own realities and to collectively develop proposals aimed at environmental restoration, democratic participation, and social transformation.

Consequently, the Program's contributions extend beyond teacher professional development. They also strengthen schools' institutional capacity to engage in territorial governance, promote environmental citizenship, and support community resilience in regions affected by socio-environmental disasters.

Educational practices evolved from superficial approaches to Environmental Education toward contextualized, interdisciplinary, and participatory actions. By selecting the municipality's history and its relationship with the Rio Doce as a central theme, some schools A, D, and F incorporated this perspective into their Experimental School Pedagogical Projects, thereby strengthening territorial identity. These projects recovered local memory while connecting it to future perspectives, transforming the Fundão Dam collapse into a turning point for building a renewed awareness of the region's natural and cultural heritage. (Drumond, 2025, p. 54)

Local belonging emerged as one of the most significant pillars of the **Experimental School Pedagogical Projects** developed by the schools in **Resplendor**. Understood as the recognition of collective identity and the historical and emotional bond between communities and their territory, the concept of belonging is mobilized throughout these projects as a pedagogical strategy aimed at valuing place, memory, and community life, particularly in the aftermath of the socio-environmental impacts caused by the Fundão Dam collapse.

"...Across all the documents analyzed, there is a clear intention to rebuild the bond between the school community and the Rio Doce, transforming the educational space into an active agent of both symbolic and ecological revitalization." (Oliveira, 2026a, p. 95)

In summary, according to the Course Completion Papers analyzed, the interventions carried out in the schools were successful in fostering political awareness regarding mining activities and the Fundão Dam collapse, mobilizing school communities to incorporate these issues into their curricula and to develop thematic **Experimental School Pedagogical Projects**. These projects came to be regarded as important instruments for disseminating knowledge and promoting public debate. It can therefore be concluded that the pedagogical approach adopted in the Specialization Course was considered successful by its participants.

This is by no means a trivial issue within the context of the Rio Doce Basin. One of the central hypotheses underlying this study was that **Countryside Schools** would demonstrate greater engagement because they constitute interested parties directly affected by water and soil contamination and by the disruption of their traditional ways of life, as suggested in the literature (Martínez-Alier, 2012). Our findings indicate that this assumption holds true for some Rural Schools under these circumstances. According to Drumond (2026):

The school community's perception of mining activities and the Fundão Dam collapse is heterogeneous, varying according to geographical proximity and direct experience with the disaster. In Municipal Schools A, D, and E, located near the Rio Doce, the initial fear associated with soil and water contamination gradually gave way to more active engagement by the school community. Environmental issues mobilized teachers, students, and families, particularly because they were directly linked to health and living conditions. In this context, the school came to assume an important role in re-signifying the community's relationship with its territory, contributing to the symbolic reconstruction of the lived environment. (Drumond, 2026, pp. 46–47)

Although this selective identification among affected communities proved to be an important catalyst for the development of the educational activities, the limitations associated with the perception of "**being affected**" were clearly recognized by the course participants. Throughout the training process, they developed a broader understanding of what it means to be affected—an understanding promoted by social movements and the **Independent Technical Advisory Organizations (ATIs)**, which emphasize the social and economic consequences of the disaster throughout the territory. This perspective was further informed by the concept of **Pedagogical Silence** (Hunzicker & Antunes-Rocha, 2022), which

characterizes the absence of critical discussion about the dam collapse and mining activities within schools and local communities, thereby restricting an initial sense of identification with those affected. In this regard, participants faced the challenge of overcoming this **Pedagogical Silence**, and the evaluation of the educational work carried out in the schools indicates that they were successful in doing so.

In this respect, Oliveira (2026b) draws attention to the challenges involved in expanding the notion of who should be considered affected, particularly in schools that did not perceive the impacts of the dam collapse within their own local reality. Referring to the evident process of deterritorialization experienced in districts of Mariana and Barra Longa, the author states:

In this excerpt, the author unequivocally highlights a series of negative consequences resulting from the deterritorialization experienced by students from the directly affected areas. Because these communities were at the epicenter of the disaster, such impacts were highly visible and continue to be felt by those around them to this day. However, this does not mean that the population—or the students—of Galileia remained unaffected. On the contrary, this perspective underscores the need for educational processes capable of promoting understanding of these impacts and contributing to their mitigation. (Oliveira, 2026b, p. 19)

Further examining the analytical categories that appeared most frequently, it is important to clarify how the descriptors **"Teaching framework aligned with issues related to rural life"** (identified 24 times) and **"Practices contextualized to the realities of rural areas"** (identified 23 times) were interpreted in the analysis. Although the Rural Education literature traditionally employs these descriptors to refer to agrarian issues, agroecological practices, rural depopulation, and related themes, the references found in the Course Completion Papers concern the collection of contextual information regarding the thematic triad within the communities where the schools are located—namely, rural communities. In other words, the Specialization Course was not intended to provide an in-depth theoretical discussion of issues traditionally addressed in the Rural Education literature—although some Course Completion Papers sought to establish such connections—but rather to investigate how the thematic triad manifested itself within the affected school communities. Under these circumstances, the impacts of the thematic triad on rural populations and their specific demands were considered, sometimes more explicitly and sometimes more broadly, as illustrated in the following excerpts describing educational practices subsequently adopted by the schools:

The theme proposed for the SEPP (...) makes it possible to strengthen the community's connection—whose livelihoods depend upon land and water—with the Rio Doce, while using local history as a starting point for developing environmental awareness. (Drumond, 2026, p. 41)

The discussion circle evoked numerous memories, fears, and concerns regarding the uncertain future of quality of life in Resplendor. Participants emphasized, however, that the Political-Pedagogical Project should be developed collectively and rooted in students lived realities, valuing the municipality's geographical spaces. (Oliveira, 2026a, p. 88)

The absence of a more specialized perspective on the realities of rural communities is evidenced by the limited or nearly absent occurrence of descriptors specifically related to rural life, such as **Land Ownership and Use, Encouragement of Rural Succession, Use of Agroecological Production Techniques, Practices Supporting Family Farming, Peasant Culture as a Teaching Resource, and Recognition of Knowledge Produced in Rural Communities.**

The scarcity of these descriptors does not indicate that the educational activities failed to address local realities. Rather, it reflects the fact that the Specialization Course was designed primarily to investigate the impacts of mining activities, the Fundão Dam collapse, and the revitalization of the Rio Doce Basin, rather than to comprehensively address all dimensions traditionally encompassed by **Rural Education.** Nevertheless, the findings suggest that the pedagogical processes implemented by the Program possess considerable potential to be further developed through a more explicit incorporation of Rural Education principles into future training initiatives.

Another noteworthy finding concerns the gradual transformation of the schools' **Political-Pedagogical Projects.**

Across all participating schools, discussions concerning the Fundão Dam collapse and the presence of mining activities in the territory ceased to be peripheral issues addressed only on commemorative dates or through isolated activities. Instead, these themes became integrated into teaching sequences, interdisciplinary projects, and collective planning processes. This shift was reflected in revisions to the Political-Pedagogical Projects, modifications to teaching plans, and changes in teachers' professional identities, as they increasingly came to view themselves as facilitators of socio-environmental dialogue rather than merely transmitters of disciplinary knowledge. (Lima, 2025, p. 36)

Similarly, Oliveira (2026a) argues that the incorporation of the thematic triad into school planning strengthened the relationship between schools and their surrounding communities, allowing educational institutions to become spaces for collective reflection and democratic participation:

The inclusion of mining, the Fundão Dam collapse, and the revitalization of the Rio Doce Basin within the school's Political-Pedagogical Project fostered a process of collective reflection involving teachers, students, families, and community members. This process strengthened the school's social function by promoting critical environmental education rooted in local realities and by encouraging the joint construction of strategies capable of responding to the socio-environmental challenges experienced by the community. (Oliveira, 2026a, p. 89)

These findings reinforce the proposition advanced by Sartoretto and Bergström (2026) that educational institutions constitute strategic spaces for mobilizing principles of **Social Justice** and **Social Sustainability** within applied fields. Rather than merely transmitting information about environmental problems, the schools analyzed in this study progressively became sites where community members could collectively interpret their own realities, critically examine asymmetrical power relations, and formulate proposals for territorial revitalization.

This movement is closely aligned with the notion of **Situated Social Justice**, identified by Sartoretto and Bergström (2026) as the most prominent emerging category in the recent literature. The educational practices documented in the Course Completion Papers consistently emphasized locally based knowledge, participatory decision-making, and the recognition of rural communities as legitimate producers of knowledge regarding their own territories. Consequently, educational practice transcended the conventional classroom environment, extending into community spaces, environmental observation, participatory mapping, interviews with local residents, and collaborative planning activities involving diverse social actors.

From the perspective of **Social Sustainability**, the Program likewise demonstrated significant contributions. The educational interventions encouraged participants to recognize the interdependence between environmental restoration, community well-being, democratic participation, and the preservation of local identities. Rather than approaching sustainability exclusively through ecological indicators, the Program adopted a broader understanding in which environmental recovery was inseparable from social participation, educational equity, and the strengthening of collective agency.

This articulation between **Countryside Education**, **Social Justice**, and **Social Sustainability** constitutes one of the main theoretical contributions emerging from this study. The analytical framework developed here demonstrates that the principles historically constructed by the Brazilian Countryside Education movement converge with contemporary international discussions on social justice and sustainability, particularly regarding community participation, recognition of territorial knowledge, democratic governance, and the pursuit of socially just forms of sustainable development. Such convergence provides a consistent theoretical basis for evaluating educational programs aimed at territories affected by socio-environmental disasters and for designing future teacher education initiatives committed to democratic, territorially grounded, and socially transformative educational practices.

Conclusions

The findings of this study indicate that the activities developed within the Specialization Course of the Rio Doce School Program contributed to overcoming Pedagogical Silence regarding mining practices and the Fundão Dam collapse in schools serving communities affected by the disaster. Rather than simply introducing new curricular content, the Specialization Course fostered changes in educational practices, contributed to school organization through an interdisciplinary approach to integrative themes, and strengthened the identity of the school communities studied. These changes are attributed to the methodology proposed by the Specialization Course, which was grounded in educational processes based on dialogue, community participation, and critical engagement with local realities.

These findings reinforce the proposition advanced by Sartoretto and Bergström (2026) that educational institutions constitute strategic spaces for articulating and mobilizing emerging principles of Social Justice and Social Sustainability in applied fields.

The principles historically developed by the Countryside Education movement in Brazil demonstrated strong theoretical and methodological convergence with recent international discussions on Social Justice and Social Sustainability, particularly regarding situated justice, collective participation, equitable social relations, and the recognition of local knowledge. This convergence broadens the analytical possibilities available for evaluating educational policies and teacher education programs, while also contributing to the internationalization of theoretical contributions originally developed within the Brazilian context.

This articulation constitutes one of the main theoretical contributions emerging from this study, providing a theoretical basis for evaluating educational programs aimed at territories affected by socio-environmental disasters – particularly those involving populations experiencing conditions of vulnerability – and for designing future teacher education initiatives committed to democratic, territorially grounded, and socially transformative educational practices.

The study also identified, however, that although the Course was guided by the principles and methodology of Countryside Education, descriptors specifically associated with peasant ways of life – including family farming, agroecological practices, countryside succession, and the valorization of countryside knowledge – appeared only marginally in the educational experiences analyzed. Although the primary focus of the Specialization Course was to overcome Pedagogical Silence, future teacher education initiatives could benefit from a more explicit integration of the descriptors developed within Countryside Education with strategies for environmental education and territorial revitalization, deepening discussion and reflection on peasant ways of life and the challenges posed by mining practices.

It should be noted that, given the corpus analyzed, this was an exploratory study. Future research could expand the corpus or employ interviews, classroom observations, participatory action research, or long-term school monitoring, which could provide a more comprehensive assessment of the educational impacts of the Program and its long-term influence on school communities.

Finally, the analytical framework proposed in this study may also contribute to the design, implementation, and evaluation of educational policies in other territories affected by environmental conflicts worldwide. As climate change, extractive activities, and socio-environmental disasters increasingly affect vulnerable populations, educational programs that integrate critical pedagogy, community participation, and territorially grounded approaches to sustainability are likely to become increasingly relevant to the promotion of democratic, socially just, and environmentally sustainable futures.

Declarations

Author Contribution

M.L.S. wrote the main manuscript text; prepared the table; reviewed the manuscript. M.I.A.R. reviewed the manuscript.

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Tables

Table 1 is available in the Supplementary Files section.

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