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Educação Ambiental crítica e o território da Zona da Mata mineira: um diálogo necessário

Alen Batista HENRIQUES [1]

Resumo

A Zona da Mata de Minas Gerais foi a última região do Estado a ser colonizada. Nas últimas décadas este território vem vivenciando experiências econômicas produtoras de impactos ambientais como as ligadas à mineração e à construção de barragens. Os objetivos deste artigo se encontram na discussão sobre a educação ambiental crítica enquanto ferramenta para compreensão das demandas ambientais atuais. Para tanto, o texto se amparou em uma pesquisa bibliográfica e em dados secundários. Inicialmente, é apresentado um histórico do processo de ocupação e degradação ambiental da Mata mineira. Em seguida, se discute a relação entre o modelo econômico implantado em porções desse território e a produção de vulnerabilidades socioambientais. Por fim, são expostos conceitos da educação ambiental crítica articulando-a ao processo de crescimento econômico e às correntes de pensamento ambiental. Conclui-se que a defesa da educação ambiental crítica é necessária para o fortalecimento de um contraponto frente aos modelos de pensamento hegemônicos.

Palavras-chave: Educação. Minas Gerais. Meio ambiente. Mineração e hidrelétricas. Desenvolvimento econômico.

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Critical Environmental Education and the territory of Zona da Mata in Minas Gerais: a necessary dialogue

Alen Batista HENRIQUES

Abstract
The forest in Zona da Mata (Minas Gerais) was the last Brazilian region to be colonized. In recent decades, this territory has witnessed economic experiences that produce environmental impacts, including mining operations and dam constructions. The main focus of this article is to discuss critical environmental education as a tool for understanding current environmental demands. The text was reinforced with bibliographical research and secondary data. First, a history of the process of occupation and environmental degradation of Zona da Mata is presented. The following section examines how the economic model used in certain areas of this region contributes to the creation of socio-environmental vulnerabilities. Finally, concepts of critical environmental education are discussed, connecting it with the process of economic growth and environmental perspectives. We believe that advocating for critical environmental education is crucial to strengthen an alternative point of view to hegemonic models of thought.

Keywords: Education. Minas Gerais. Environment. Mining and hydroelectric plants. Economic development.

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Educación Ambiental Crítica y el territorio de la Zona da Mata de Minas Gerais: un diálogo necesario

Alen Batista HENRIQUES

Resumen
La Zona da Mata de Minas Gerais fue la última región del Estado en ser colonizada. En las últimas décadas, este territorio experimentó actividades económicas que producen impactos ambientales, como la minería y la construcción de represas. Los objetivos de este artículo se encuentran en la discusión sobre la educación ambiental crítica como una herramienta para comprender las demandas ambientales actuales. Para ello, el texto se basó en una investigación bibliográfica y en datos secundarios. Inicialmente, se presenta un historial del proceso de ocupación y degradación ambiental de la Mata mineira. Luego, se discute la relación entre el modelo económico implantado en partes de este territorio y la producción de vulnerabilidades socioambientales. Finalmente, se exponen conceptos de la educación ambiental crítica, articulándola con el proceso de crecimiento económico y las corrientes de pensamiento ambiental. Se concluye que la defensa de la educación ambiental crítica es necesaria para fortalecer un contrapunto frente a los modelos de pensamiento hegemónicos.

Palabras clave: Educación. Minas Gerais. Medio ambiente. Minería e hidroeléctricas. Desarrollo económico.

Introduction

> "...although one continuously traverses forests, the journey is by no means monotonous. The variety, the strikingly fresh greenery of all the plants, the diversity of hues, the towering trees rising like an amphitheater along the slopes of the hills, the tranquility, and, so to speak, the stillness of the woods, the play of light caused by the uneven terrain in short, everything surrounding the traveler combines to produce a delightful impression on the spiri..." (SAINT-HILAIRE, 1938, p. 103).

The description provided by the French traveler in the 19th century reveals the natural conditions of what is now the Zona da Mata region of Minas Gerais at that time. This territory, marked by the exuberance of the Atlantic Forest and delineated by the Paraíba do Sul River a crucial waterway fed by smaller rivers originating from or crossing the region was historically the last area in Minas Gerais to be opened to European colonization. Coffee cultivation became one of its economic mainstays by the late 19th century. This isolation was part of a strategy by the Portuguese Crown to prevent gold smuggling from the central region of the then mining province (MERCADANTE, 1973).

The natural landscape of the Zona da Mata in the first quarter of the 21st century is markedly different from the one described by the French traveler. The forests that gave the region its name have nearly vanished. Rivers now suffer from degradation and intensive damming, which restricts their flow, affecting the environment, life, and collective health in the region. While in the past the region served as a natural bastion against gold diversion, it now, like other parts of the state, suffers from the damages caused by predatory economic ventures, such as mining and dam construction for hydroelectric power generation.

These ventures are bolstered by the prevailing economic model of a globalized world. In Latin America, one characteristic of this model, defined by Gudynas (2009; 2012a) as *neo-extractivism*, is a development strategy based on economic growth focused on the exploitation of natural resources, non-diversified production networks, and subordinated international integration. In this model, referred to by David Harvey as "accumulation by dispossession" (2005), peasant populations are expelled from rural areas, forming a landless proletariat; shared resources, such as water, are privatized and integrated into capitalist accumulation logics; indigenous forms of production and consumption are suppressed; and family farming gives way to agribusiness.

Peripheral nations of the Global South, such as Brazil, have thus redefined their integration into the global economy through the production and export of commodities, whether agricultural or mineral/metallic (ANDRADE, CARMO, HENRIQUES, 2022; HENRIQUES & PORTO, 2014; 2013). The Zona da Mata has been targeted by business groups in the bauxite mining industry—bauxite being the raw material for aluminum (VIEIRA & ZANOTELLI, 2022)—and by initiatives

related to hydroelectric power generation through dam construction (CRISTÓVÃO, 2014). Both mining and dam construction share similar characteristics, such as producing environmental and social impacts in the territories where they operate. These activities create scenarios of environmental injustice and primarily serve interests external to the affected regions.

Consequently, the deepening of social inequalities resulting from an asymmetric and environmentally predatory development model has contributed to the spread of discourses around sustainable development, education for development, and the normalization of market forces and neoliberal ideologies as mechanisms of social regulation (HENCKE & SILVA, 2022; LIMA, 2009). In this context, where ecosystem degradation and the erosion of social relations converge, the need to discuss an environmental education paradigm aligned with critical thinking becomes both important and indispensable.

Drawing on Freirean references, such as the *Pedagogy of Autonomy* (FREIRE, 1996), which provides a foundation for discussing processes of exclusion and impoverishment among workers, the objective is to present critical environmental education as a tool that can contribute to a holistic, integrative, complex, and alternative understanding of environmental education, challenging conservative approaches in the face of environmental degradation in the Zona da Mata. Methodologically, this text was developed based on a bibliographic review and secondary data analysis.

In the first part of the text, some characteristics of the historical process of occupation and the current economy of the Zona da Mata region in Minas Gerais will be presented, with a focus on their relationship with environmental issues. Subsequently, counter-hegemonic development models rooted in parameters such as sustainability will be discussed. Finally, the text will address the frameworks of environmental education that, contextualized with current social and environmental demands, can contribute to advancing toward the incorporation of critical environmental education in schools.

Zona da Mata Mineira: Territory and Environmental Degradation

The occupation of the mesoregion now known as the Zona da Mata was closely tied to the decline of gold mining in the central region of Minas Gerais. According to Valverde (1958), the region's name alludes to its original landscape, once covered by the Atlantic Forest. In the past, the

Atlantic Forest's vegetation served metropolitan interests by preventing gold smuggling and diversion. To this end, the Portuguese government deliberately restricted access to the region, attempting to turn it into a natural barrier against the misappropriation of gold.

Historically, the Zona da Mata in Minas Gerais was one of the last bastions protecting the gold-bearing areas located more centrally in the present state of Minas Gerais. Its settlement for effective colonization was delayed, beginning only in the early decades of the 19th century. This occupation was accompanied by the replacement of the Atlantic Forest with crops that alternated over time. As noted by Valverde (1958, p. 5) in a pioneering study from that year, "one of the current [1950s] characteristics of the Zona da Mata landscape is the lack of forests."

According to Carvalho (1953), the first settlements, such as Simão Pereira, Matias Barbosa, and Chapéu D'Uvas, emerged following the opening of the *Caminho Novo*, a route that cut through the Zona da Mata between the Serra do Mar and the Paraíba do Sul Valley, and later between the Paraibuna Valley and the Serra da Mantiqueira, connecting the captaincies of Minas Gerais and Rio de Janeiro. With the decline in gold production, the Zona da Mata became an economic alternative.

Coffee production played a significant role in the settlement and occupation of the Zona da Mata. By around 1819, Taunay (1945) already noted exports of coffee produced in the region. Minas Gerais' coffee production increased with the expansion of plantations in the Zona da Mata, peaking in the early 20th century. Oliveira (2000) explains that the settlement and growth of coffee production in the Zona da Mata resulted from a centrifugal movement of its elites, who had previously been involved in other economic activities such as mining and the supply chains of the Center-South region. The region's proximity to Rio de Janeiro, the growth of production in areas like the Paraíba Valley, and rising external market demand spurred coffee production in the Zona da Mata throughout the 19th century.

Economic growth in the Zona da Mata was boosted in the second half of the 19th century by the construction of several railroads. The earliest reference to railroad construction in the region dates to 1842 (CARNEIRO, 2008), when the vice-president of the province of Minas Gerais argued for expanding routes from Ouro Preto to the Paraibuna River Valley, aligning with the interests of coffee growers. However, it was in the latter half of the 19th century that railroad construction truly took off in the region.

The implementation of railroads in the Zona da Mata during the second half of the 19th century was closely tied to the expansion of coffee exports. Silveira (2009, p. 15) describes the establishment of the railway system in the region as the result of a confluence of interests between the railroads and

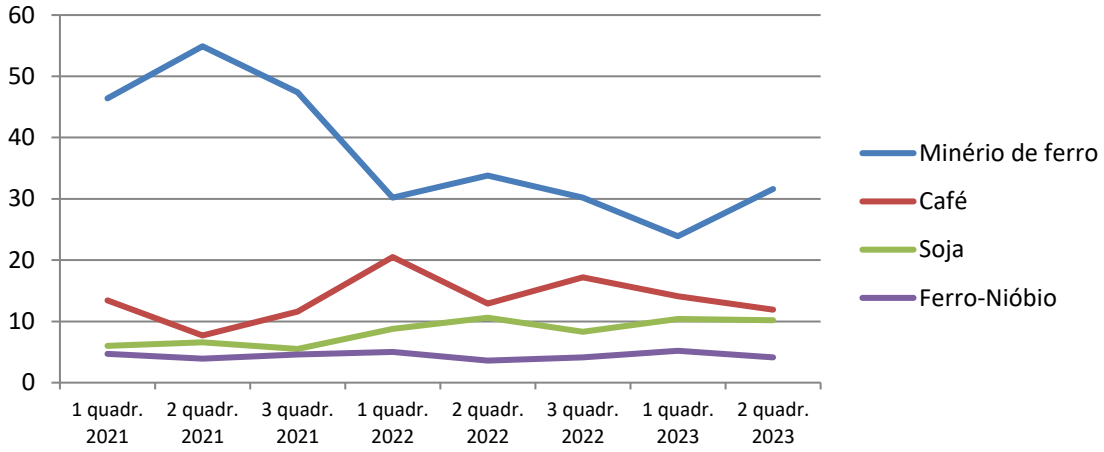
coffee production. According to him, the expansion of the railway network stimulated the growth of coffee production while coffee revenues financed the railroads. At a time when wealth correlated closely with the growth of coffee exports, railroads gained prominence for their speed and high cargo transport capacity.

There appeared to be a consensus in the Zona da Mata that railroads were crucial both for stimulating economic development and boosting exports, as well as for promoting geographic integration in the province by connecting various otherwise isolated localities. The Zona da Mata's pioneering role in receiving the first railroad tracks can be attributed to the region having valuable commodities for trade, which was not the case for other parts of the province at the time. According to Blasenheim (1996), the people of Minas Gerais believed in the potential of railroads to drive economic growth across the province, integrate regions, and support exports. Coffee produced in the Zona da Mata served as a compelling argument for other parts of Minas Gerais to accept that the provincial government prioritize building a transportation system in this region over others (BLASENHEIM, 1996).

The history of Portuguese occupation in what is now Minas Gerais is closely intertwined with the search for minerals and precious stones. Over two centuries later, the state's economy remains heavily reliant on the extraction and export of minerals. While gold and diamonds have diminished in importance, they have been supplanted by iron ore, bauxite, niobium, and other minerals (FJP, 2023). The economy of Minas Gerais is heavily dependent on the production and export of commodities, whether mineral or agricultural. Additionally, the state exports semi-finished products, such as steel. Graph 1 - International Trade of Minas Gerais (2021–2023) illustrates the main exports from the state, presented as percentages over the past three years. Despite seasonal variations throughout the months surveyed, it is evident that more than fifty percent of Minas Gerais' total exports were concentrated in a small list of commodities, predominantly minerals and agricultural products, with iron ore being particularly prominent.

Graph 1- International Trade of Minas Gerais from 2021 to 2023[2]

[2] The data for 2023 are limited to the 1st and 2nd four-month periods, as information for the final four-month period is not yet available.



Source: https://fjp.mg.gov.br/comercio-interestadual-e-internacional/. Accessed on November 30, 2023.

Regarding the Zona da Mata region of Minas Gerais, it has received investments in recent decades that enabled its inclusion in the national mining circuit. Unlike other regions of the state, in Zona da Mata, these investments were directed solely toward exploration and processing. The presence of bauxite attracted a major national company (Cia. Brasileira de Alumínio – CBA, part of the Votorantim Group), which, taking advantage of its relative proximity to its factory in the state of São Paulo and the existence of a railway infrastructure[3], stablished two processing units in the region, located in the municipalities of Itamarati de Minas and Miraí.

The area of bauxite occurrence in the region is extensive and extends beyond the territories of the two aforementioned municipalities. Despite the existence of two processing plants, the licensing area for exploration encompasses protected territories, such as the Serra do Brigadeiro State Park (SILVA and IORIO, 2022). It is worth noting that plans to expand mining activities in this region have faced resistance from local organized groups, such as rural unions and associations advocating for the protection of the Serra do Brigadeiro Park (SILVA and IORIO, 2022; MAFFIA, 2011; IORIO and MAGNO, 2019).

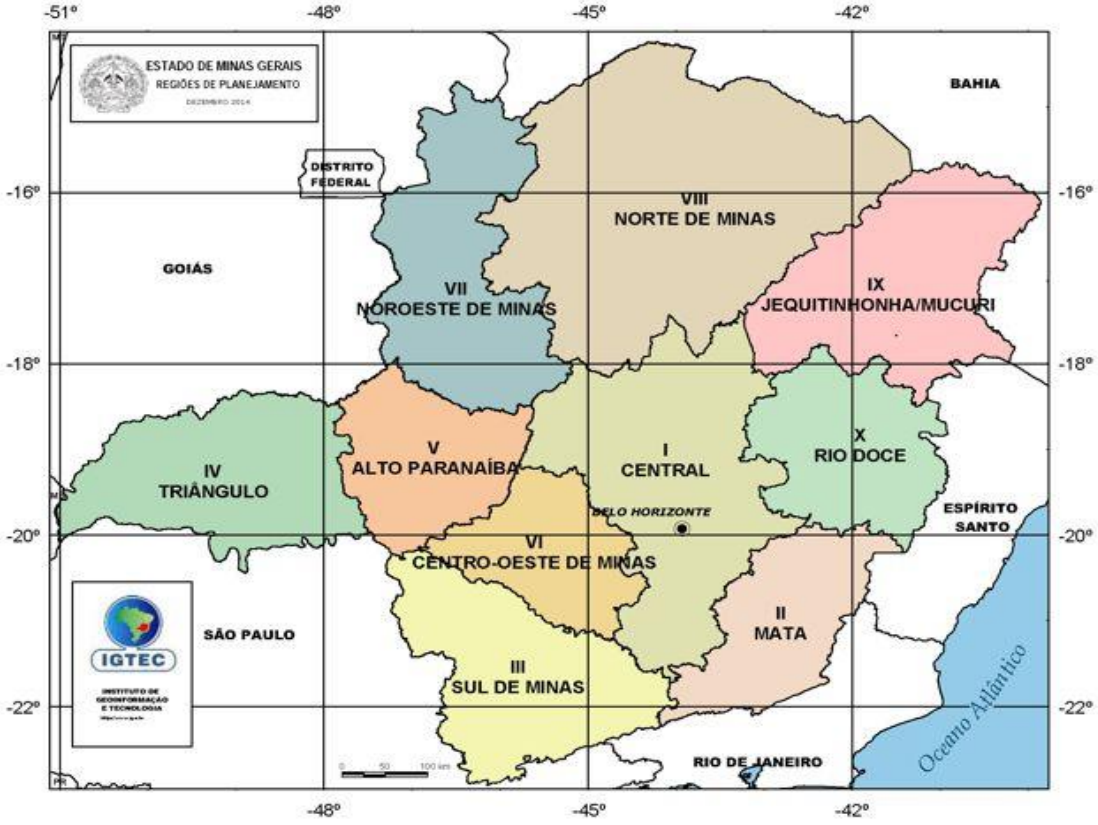
Another recent feature of the current economic context of the Zona da Mata region has been the increase in electricity generation through river damming. Zona da Mata is a pioneer in hydroelectric power generation. The first power plant in South America (Marmelos Power Plant) was built in the late 19th century in the municipality of Juiz de Fora (TEIXEIRA, 2011). At the threshold of the second decade of the 21st century, the state of Minas Gerais had the largest number of hydroelectric power generation units in the country (256), including 53 hydroelectric power plants

[3] Currently, the transportation of production is carried out via roadways. The use of the railway was discontinued when the exploration and processing activities at the Itamarati de Minas unit were halted.

(HPPs), 138 small hydroelectric power plants (SHPPs), and 65 mini hydroelectric power plants (MHPs) (ANEEL, 2023). In the same year, the following were in operation in the Zona da Mata region: 14 hydroelectric power plants, 20 small power generation facilities, and 12 Mini Hydroelectric Power Plants (ANEEL, 2023).

Map 1 of the Mesoregions of Minas Gerais, presented below, highlights the Zona da Mata region and its location in the southeastern part of the state. It is bordered by the regions of South Minas, Central Minas, and Rio Doce, as well as the states of Rio de Janeiro and Espírito Santo.

Map 1 - Mesoregions of the State of Minas Gerais



Source:https://www.mg.gov.br/pagina/geografia#:~:text=As%2012%20mesorregi%C3%B5es%20estabelecidas%20pelo,das%20Vertentes%20e%20Zona%20da, accessed on 25 Dec. 2023.

Environment, Conflicts, Development, and Environmental (In)Justice.

Conflicts between economic and environmental interests[4] are discussed by Martinez-Alier (2007) as a central subject of the field of political ecology. This author, while rejecting the notion of

[4] The documents and reports produced by the Comissão Pastoral da Terra (CPT), affiliated with the National Conference of Bishops in Brazil (CNBB), are highly illustrative for understanding rural conflicts, which are often linked to environmental issues. In 2022, 2,018 rural conflicts were recorded in the country, involving more than nine hundred thousand people (909,450) and resulting in 47 murders. In Minas Gerais, during the same year, 64 conflicts were

economic dematerialization in recent decades, argues that contemporary environmental conflicts arise precisely from the assaults on remnants of the ancient natural world and the search for raw materials and waste disposal sites in human-occupied spaces. Martinez-Alier (2007) points out that the low prices of raw materials, transportation, and the zero cost of waste sinks do not necessarily indicate abundance. This reality, in fact, reflects a specific distribution of property rights, power, and income.

Thus, the environmental burden of the economy is constantly increasing, driven by consumption and demographic growth, despite the higher monetary values of the service sector (MARTINEZ-ALIER, 2007). It is also true that, in certain geographic areas, some impacts tend to be mitigated, which cannot necessarily be understood as an indicator of sustainability, as other impacts are generated on different scales. For instance, environmental improvements may arise in certain nations due to the transfer of contamination to other countries (MARTINEZ-ALIER, 2007).

In the last decade of the 20th century, in 1991, a statement made by a World Bank economist supported the idea of transferring pollution sources to poorer nations: *"Let's be honest, shouldn't the World Bank be encouraging the migration of polluting industries to less-developed countries?"* (ACSELRAD, MELLO, and BEZERRA, 2009, p. 7). Despite the discomfort caused by this remark, it reveals an economic scenario that remains relevant, characterized by the transfer of environmentally damaging enterprises to poorer regions of the planet. These areas are marked by socioeconomic deprivation, are inhabited by social groups without access to decision-making spheres of the State and the market, and suffer from a lack of investment in sanitation, waste control policies, etc. These factors directly contribute to poor environmental and health conditions.

Against the logic that considers the distribution of environmental risks as democratic and views the market as the cornerstone of environmental regulation, the environmental justice movements have risen. The environmental justice movement emerged in the United States during the 1970s as part of the broader struggle for civil rights.

Initially, the environmental justice movement in the United States of America arose from the struggle of Black communities against racism and was born to expose the fact that waste dumps and polluted areas were predominantly located near Black communities (BULLARD, 1996). Throughout the 1980s, this movement expanded, incorporating new dimensions. It became evident that these injustices were not limited to Black people or ethnic minorities but were also related to issues of race and gender, indiscriminately affecting the most vulnerable social groups (BULLARD, 1996).

documented, involving over twenty-four thousand people (24,239). Additionally, 116 conflicts were reported in Minas Gerais, affecting 17,904 people. Of these, 15 were related to water, involving 1,381 individuals (CPT, 2023).

According to Bullard (1996), the core of environmental justice lies in developing tools, strategies, and public policies aimed at eradicating the conditions that foster scenarios where injustices prevail. It seeks to uncover hidden assumptions that contribute to differentiated exposures and unequal protection. Relevant ethical and political issues, such as questions about ownership who owns what, since when, and so forth are also brought to the forefront for discussion.

Social inequity highlights the debate within the environmental justice movement regarding the unequal distribution of space among socially vulnerable groups, characterized by a geographic and social division of power. In this context, the environmental justice movement can play a significant role in exposing the reality that vulnerable social groups are politically powerless and subjected to environmental inequities because of barriers preventing them from rejecting the risks they are forced to endure.

In this study, the concept of Environmental Justice follows the definition proposed by the Brazilian Network for Environmental Justice (RBJA), which seeks to ensure "that no social group, whether ethnic, racial, or class-based, bears a disproportionate share of the negative environmental consequences of economic operations, policy decisions, or federal, state, or local programs, as well as the absence or omission of such policies" (RBJA, 2013).

In peripheral countries like Brazil, the contexts of inequality differ from those in nations with diverse levels of economic development, such as those in the Global North. As Herculano (2002) argues, scenarios of injustice must include the lack of sanitation, inequities in public health, education, income, housing, and so on, which are directly associated with low-income populations in both urban and rural territories. These social groups bear a disproportionate burden of the externalities resulting from wealth production in the Brazilian economy. In this light, within the Brazilian context, it is reasonable to broaden the analytical focus of environmental (in)justice issues beyond strictly racial themes, without discarding them altogether.

As Porto-Gonçalves (2004, p. 24) states, "development is the synthetic name for the idea of domination over nature," such that "to be developed" aligns with the notion of being "urban" and "industrialized." Thus, development encompasses everything that distances us from "nature and places us before human constructs, such as cities and industries" (2004, p. 24).

The contemporary debate on development concepts is part of the current global agenda and, as Gallo and Seti (2012) point out, is marked by tensions between opposing worldviews. At opposite ends of the spectrum are defenders of the current development model and advocates of a radical conservation model. Between these extremes lie proponents of what could be called an alternative

model, based on firm positions regarding development and preservation through a perspective of promoting equity and socio-environmental sustainability (GALLO and SETI, 2012; MARTINEZ-ALIER, 2007). According to Porto and Milanez (2007), this perspective must be grounded in policies oriented toward an agroecological transition, fostering sustainable and equitable alternatives, such as agroecology for small and medium-sized farmers.

From the perspective of Martinez-Alier (2007, p. 280), the concept of development can be understood according to economic criteria and what he calls "physical and social notions." In the case of the first option, economic priorities tend to align with weak sustainability, while the second alternative emphasizes strong sustainability. Furthermore, according to Martinez-Alier (2007), unlike the nations of the Global North, in countries of the Global South, movements leaning toward traditional agroecology offer a development alternative for millions of peasant families. The environmental thought of regions such as Latin America can contribute to the adoption of alternative practices, particularly due to awareness of the historical foreign exploitation and the ecologically unequal exchange imposed on this continent by central nations (MARTINEZ-ALIER, 2007).

According to Sousa Santos (2010), the concept of development in the Western world is reduced to the paradigm of capitalist development. This paradigm of Western modernity is based on the assumption of the availability of raw materials from colonial markets. For Sousa Santos (2010), this model carries a dual contradiction: the belief in universal principles of development that are only validated in central nations, and the principles of emancipation, which aim to promote equality and inclusion as ultimate goals but are curtailed by regulatory principles responsible for managing the inequality and exclusion produced by capitalist development.

Porto (2007) associates the hegemonic capitalist development model with the production of preventable diseases and deaths. Transforming these situations toward the creation of healthy territories requires dynamic and collective social processes. These dynamics tend to foster the development of "virtuous cycles of development, in which wealth creation is not inherently tied to the destruction of lives and ecosystems but rather to human development and the protection of life, including ecosystem health" (PORTO, 2007, p. 110-111). This path, proposed by Porto (2007), has been followed by indigenous and peasant groups who have "sustainably co-evolved with nature" while ensuring its conservation (MARTINEZ-ALIER, 2007, p. 34).

Currently, various organizations representing farmers take pride in showcasing their agroecological techniques through complex agricultural systems and seed diversity. This movement

is known as *popular environmentalism* or *the environmentalism of the poor* (MARTINEZ ALIER, 2007).

Critical Environmental Education: A Necessary Approach

Environmental education in Brazil began to take shape as a field of knowledge in the 1970s. Its consolidation, particularly over the past few decades, is the result of a long-standing historical movement led by social agents from different sectors of society, each carrying distinct discourses. These discourses reflect how they understand, produce, and perceive environmental issues and how they address contemporary challenges through education (LIMA, 2009).

During its development as a field of knowledge, the term *environmental education* has been used diffusely by the media, in corporate environmental management projects, and within school teaching plans and curricula. However, the objectives of the institutions and individuals adopting the discourse of valuing environmental education are questionable. Likewise, it is evident how the term has been trivialized and used without proper depth or contextualization of its principles (RESES, 2010).

Advertising in the media highlights this issue. Many commercials emphasize the need to protect the environment while simultaneously promoting the consumption of so-called "eco-friendly" products as a panacea for mitigating environmental problems. The often fatalistic discourse presented in news outlets suggests individual and naïve solutions to an overwhelmingly complex situation (GUIMARÃES, 2013). Similarly, schools frequently adopt this simplistic discourse of environmental education by proposing activities and projects disconnected from a critical understanding that values its complexity. For instance, this can be observed in routine school activities such as making toys from reused solid waste (labeling these activities as recycling), planting tree seedlings, and similar efforts.

Criticizing this model of education, Loureiro (2006, 2019) asserts that environmental education is being addressed in schools in a superficial, depoliticized, conservationist, and traditional manner. This model trivializes the concepts of citizen and citizenship, perceiving human beings as abstract, ahistorical, and decontextualized.

According to Guimarães (2004, p. 26-27), this model of environmental education understands the world through a perspective that "fragments reality, simplifying and reducing it, thereby losing the richness and diversity of relationships." In this sense, "focused on the parts, it obscures the whole

in its complex interrelations, like a camera that, when focusing on a single part, blurs the broader landscape".

Como resultado, isso "produz uma prática pedagógica objetivada no indivíduo (na parte) e na transformação de seu comportamento (educação individualista e comportamentalista)" (GUIMARÃES, 2004, p. 26). Consequently, it becomes apparent that,

> society is perceived as the sum of its individuals, leading to the idea that transforming individuals will transform society. This is a simplistic and reductive perspective of understanding a reality that is complex and goes beyond the sum of its parts as a totality. It fails to consider the perspective of education as a process realized through the transformation of the individual within a collective process of transforming socio-environmental reality as a dialectical totality in its complexity. It does not grasp that education is relational and occurs within the process itself, not simply in the success of changing an individual's behavior" (GUIMARÃES, 2004, p. 26).

Conservative environmental education prevailed as a paradigm in Brazilian education until the 1990s, supported by an academic logic that "addressed environmental issues in isolation from social and political matters, reducing the complex phenomena of this reality" (VIEIRA and ZANON, 2023, p. 2).

Conservative environmental education was strongly influenced in its genesis by the natural sciences, particularly biological sciences. This can be understood by the pioneering role these sciences played in studying, perceiving, and denouncing environmental changes (LIMA, 2005). However, this origin, stemming from the fragmentation and specialization of knowledge, tends to lead natural scientists to focus on their fields of expertise, emphasizing dimensions related to their training. This means that, concerning environmental problems, natural aspects are often emphasized at the expense of other dimensions, such as social, economic, political, and cultural ones (LIMA, 2009).

As a result, conservative environmental education views the environmental crisis from an ecological perspective that, according to Lima (2009, p. 153), disregards the understanding and incorporation of political and social aspects, such as economic development models or the lack of a critical view of science and the State, which are perceived as neutral institutions. Similarly, the conservative environmental education paradigm overlooks the "social responsibilities of the agents causing environmental problems" and lacks a deeper exploration of the relationship between economics and ecology.

The explanatory model of this framework is based on the dissociation between environment and society. Generic statements are common, portraying humans as adversaries of nature or attributing the environmental crisis solely to anthropic actions. While these interpretations are not

entirely incorrect from a generic perspective, they lack contextualization and contribute to a shallow and naïve understanding of environmental issues. The conception of the environment as separate from society aligns with conservationist and preservationist ecological currents. At the theoretical foundation of these currents are nuances related to the veneration of wildlife, advocating for the preservation of parks and/or natural reserves free from human interference (MARTINEZ-ALIER, 2007; JATOBÁ, CIDADE, and VARGAS, 2009).

For Martinez-Alier (2007, p. 21), environmental movements, which provide the foundation and theorize the strands of environmental education, can metaphorically be understood as "channels of a single river." Among these channels, the author identifies three currents that lie at the heart of environmental discussions and discourses: "the cult of the wild," the "gospel of eco-efficiency," and the "environmentalism of the poor".

The so-called "cult of the wild" originated in the United States. This movement emerged from the defense of untouched nature, including primary forests and waterways. With an ecological focus, this current does not oppose economic growth but aims to preserve what remains of the original natural world. The scientific foundation of this current was developed during the 1960s through conservation biology (MARTINEZ-ALIER, 2007). Among the environmental movements aligned with this first current are organizations based in the Global North, such as the International Union for the Conservation of Nature (IUCN) and the Worldwide Fund for Nature (WWF)[5].

The second environmental current is referred to by Martinez-Alier as the creed or gospel of eco-efficiency. Unlike the first, this current focuses on the environmental impacts or health risks stemming from human activities such as industrialization, urbanization, and modern agriculture. Its emphasis lies on economics. Similar to the first current, it does not oppose economic growth, but not at any cost (MARTINEZ-ALIER, 2007). It upholds ideas such as sustainable development, ecological modernization, or the efficient use of resources.

The foundational premises of this current are twofold: on one hand, economic, with proposals such as eco-taxes, emission permits[6] etc. on the other, technological, supporting measures aimed at saving energy and raw materials, for instance. Ecology within this current can be understood as a managerial science tasked with cleaning up or remedying the degradation caused by industrialization

[5] The concern with wildlife preservation, inherent to this current, can be exemplified by the restoration of the Everglades (a wetland ecosystem located in Florida) or the reintroduction of wolves in Yellowstone National Park in the United States (MARTINEZ-ALIER, 2007).

[6] The so-called carbon credit market emerged following the signing of the Kyoto Protocol, which established the reduction of greenhouse gas emissions. To achieve this, a certification system for emission reductions was created. Thus, those who successfully reduce emissions earn credits and can trade them with nations that have targets to meet.

(VISVANATHAN, 1997). Promises of genetic improvements[7] that could eliminate the use of pesticides, as well as neo-Malthusian interpretations, are also examples championed by proponents of this current. Lastly, the discourse of eco-efficiency is characterized primarily by its connection to corporate interests and an economic-centric view of so-called sustainable development.

Conservationist/preservationist environmental education, by focusing on the effects rather than the causes, adopts a technicist approach that, based on evidence of environmental impacts, proposes technological solutions for problems that demand more complex responses (LIMA, 2009).

The technicist view of environmental education is rooted in the belief in technological optimism regarding environmental issues. This optimism stems from the confidence that economic growth alone would suffice to overcome the environmental crisis through the development and adoption of more efficient energy technologies. Social crises, such as poverty eradication, as well as the environmental crisis, would be resolved through the increase in global wealth via achieving a certain per capita income (JATOBÁ, CIDADE, and VARGAS, 2009).

As a counterpoint to conservative environmental education, critical environmental education is founded on a more complex understanding of the world, primarily aimed at creating conditions for intervention and transformation of social and environmental realities.

As Loureiro and Layrargues (2013, p. 64) suggest, critical environmental education seeks to foster at least three pedagogical dimensions:

> a) conducting a consistent analysis of the complex reality in order to establish the necessary foundations to question the historically produced social conditions that lead to social reproduction, inequalities, and environmental conflicts;
> b) fostering the autonomy and freedom of social agents in the face of the relationships of expropriation, oppression, and domination inherent to capitalist modernity;
> c) implementing the possible radical transformation of the dominant societal model, which defines the conditions of intensive degradation of nature and, within it, the human condition.

As a theoretical foundation, critical environmental education aligns with the third environmental current identified and named by Martinez-Alier (2007) as “Environmentalism of the Poor and Environmental Justice.” This current differs from the first two in its interpretation of the causes of modern environmental problems and its proposed alternatives for addressing them.

Beyond an environmentalism that assumes the causes and impacts of environmental problems are evenly distributed across the planet, critical perspectives rooted in political ecology and

environmental justice movements highlight that the exploitation of natural resources and environmental conflicts are unevenly distributed among countries, territories, and populations. These disparities are shaped by ethnic, racial, class, and gender dimensions (ACSELRAD, 2008).

For this current, environmental impacts are intrinsically linked to the global economic model and growth, such as the geographical displacement of resource sources and waste disposal areas. Northern countries increasingly rely on imports from nations in the Global South. Regions of the planet, such as Latin America, export a significantly larger volume of materials (including energy resources) than they import (PORTO and MARTINEZ-ALIER, 2007).

In this current, it is often indigenous groups and peasants who have presented alternative models of survival and development in harmony with nature, promoting conservation and biodiversity preservation. Meanwhile, the concept of Environmental Justice originates from the struggle of a social movement in the United States against localized cases of environmental racism. In Brazil, although the movement has acquired its own characteristics, including a redefinition of the concept, environmental justice can be defined as one in which:

> a) ensure that no social group, whether ethnic, racial, or class-based, bears a disproportionate share of the negative environmental consequences of economic operations, policy decisions, or federal, state, and local programs, as well as the absence or omission of such policies;
> b) ensure fair and equitable access, both direct and indirect, to the country's environmental resources;
> c) ensure broad access to relevant information about the use of environmental resources, the disposal of waste, and the location of environmental risk sources, as well as democratic and participatory processes in defining policies, plans, programs, and projects that affect them;
> d) promote the formation of collective rights subjects, social movements, and grassroots organizations to play a leading role in constructing alternative development models that ensure democratized access to environmental resources and the sustainability of their use (ACSELRAD, 2004, p.13-20).

The origins of critical environmental education coincide with the country's redemocratization process during the 1980s, which intensified the engagement of social movements under an emancipatory and critical perspective in education and popular education. This context fostered the connection and dialogue between social movements, education workers' unions, and environmentalists, linked to the country's redemocratization, socioeconomic development, and environmental degradation (LOUREIRO and LAYRARGUES, 2013). According to Loureiro and Layrargues (2013, p. 65), during this period, “environmental education came to be seen as a

continuous learning process in which individuals and groups become aware of the environment through the production and transmission of knowledge, values, skills, and attitudes".

At the core of its development were actors involved in popular education, grounded in Paulo Freire's critical and liberating pedagogy, who were instrumental in giving critical environmental education a politicized and humanized nuance. As a result, the central concept of the educational act shifted from,

> the transmission of knowledge, as if this alone were sufficient to create an "ethical subject" who would behave correctly. It is the very praxis of education—the inseparability of theory and practice in the conscious human activity of transforming the world and self-transformation that takes on proper centrality. This entails fostering continuous reflection on living conditions, in concrete practice, as an inherent part of the social process and as an indispensable element for promoting new attitudes and relationships that shape society (LOUREIRO e LAYRARGUES, 2013, p.65).

Breaking away from the economistic environmental logic is a challenge that must be addressed. Critical environmental education questions the paradigm of unlimited progress, which, according to Leff (2007), reduces and exploits nature to its maximum. Against this logic, it becomes important to legitimize alternative ways of understanding life that consider "the complexity of the world and a new ethics of praxis in the world" (LEFF, 2007, p. 9).

Breaking with the economistic logic through education should emphasize a critical and dialogical pedagogical practice in which participatory processes are restructured to overcome established forms and relations of power. The objectives must include ensuring the exercise of citizenship, particularly for those in situations of socio-environmental vulnerability. Achieving these objectives requires more than participation—it necessitates popular participation aimed at constructing processes in which "expropriated and discriminated social groups gain centrality, a condition for societal contradictions and conflicts to be exposed, confronted, and overcome" (LOUREIRO and LAYRARGUES, 2013, p. 65).

From a pedagogical perspective, "when we start from concrete subjects and situations, the conflicting dimension is addressed, making it possible to understand that environmental problems and issues are not neutral" and, therefore, are not "resolvable solely through technical intervention or individual moral desire" (LOUREIRO, 2019, p. 45). The environmental debate must include a political-ideological understanding that regulates social reproduction and recognizes that the relationship between humans and nature is mediated by historically constructed sociocultural and class relations (LOUREIRO and LAYRARGUES, 2013, p. 65).

For this, critical environmental education requires a pedagogical approach in which social contexts can be problematized in their interface with nature. From this perspective, "it is not possible to conceive of environmental problems as separate from social conflicts; after all, the environmental crisis does not represent problems of nature, but problems that manifest themselves in nature" (LOUREIRO e LAYRARGUES, 2013, p.68).

Final considerations

As presented in the text, the Zona da Mata macro-region of Minas Gerais has a historical process of environmental degradation. Traditional economic activities such as agriculture and livestock farming have, in recent decades, coexisted with new territorial rearrangements, such as mining and the increase in river damming through the construction of small hydroelectric power plants (SHPs), which are equally impactful on the environment.

These economic activities are characteristic of the hegemonic global development model, which is dominated by the belief in economic growth at any cost. This economic logic strips territories of their autonomy, entrusting their destinies to external interests and needs (SANTOS, 2008). This understanding helps to frame mining-related activities as a critical link in a global economic chain. This chain exposes the reordering (or maintenance?) of a new international division of labor, where the high-temperature phases of metallic commodity production[8] are carried out in peripheral nations of the Global South. Hydroelectric energy generation follows the same logic. The narratives surrounding hydroelectric plants (clean and environmentally friendly energy) conceal their socio-environmental impacts and the real interests of large corporations in the sector, as well as the need to supply cheap energy to energy-intensive national and multinational industries.

The so-called competitiveness of these enterprises is ensured by unaccounted socio-environmental externalities, such as environmental damage, low wages, precarious working conditions, privatization, loss of territories, and the health issues faced by the populations in the territories involved in production processes.

Despite being hegemonic, the current economic model is not universally accepted. Against its logic, criticisms are raised, and, simultaneously, alternative forms of development are defended. Among these critiques are the promotion of sustainable production methods moving toward

[8] The so-called hot phases of production are those in which metals (such as steel) are produced in steel mills. This stage of production consumes the largest amount of energy, water, and other inputs. Currently, there is a shift of these industries to peripheral nations in the Global South. The cold phase, in contrast, requires less energy (as the metal is already processed) and tends to be carried out in central nations.

agroecological practices, social participation and leadership in shaping the destinies of territories, and the appreciation of forms of solidarity economy.

The proposal for critical environmental education, drawing from the frameworks of political ecology and the environmental justice movement, positions itself as a counterpoint to the hegemonic model common to socio-environmental interpretations. Similarly, it stands in direct opposition to the economistic and utilitarian vision of the market. By way of conclusion, in a territory marked by socio-environmental inequality, such as the Zona da Mata region in Minas Gerais, critical environmental education can represent an opportunity to confront and transform the socio-environmental status quo, offering alternative pathways for political struggle toward a different and more just model of society.

References

ACSELRAD, H; MELLO, C. C. A.; BEZERRA, G. N. **O que é justiça ambiental?** Rio de Janeiro: Garamond, 2009.

ACSELRAD, H; MELLO, C. C. A.; BEZERRA, G. N. Sustentabilidade, território e justiça ambiental no Brasil. In: MIRANDA, A. C.; BARCELLOS, C.; MOREIRA, J. C.; et al. (Orgs.), **Território, ambiente e saúde.** Rio de Janeiro: Fiocruz, 2008.

ACSELRAD, H; MELLO, C. C. A.; BEZERRA, G. N. Justiça ambiental – ação coletiva e estratégias argumentativas. In: ACSELRAD, H.; HERCULANO, S.; PÁUDA, J. A. (Orgs.). **Justiça Ambiental e Cidadania**. Rio de Janeiro: Editora Relume Dumará, 2004.

ANDRADE, F. R. M.; CARMO, E. D.; HENRIQUES, B. A. Environmental Racism Dynamics in the Amazon Region, in Pará State. **Socioscapes. International Journal of Societies, Politics and Cultures**, Palermo, v. 3, n. 1, p. 71-106, set. 2022. Disponível em: <http://www.socioscapes.org/index.php/sc/article/view/99>. Acesso em: 21 nov. 2023.

ANEEL. **Agência Nacional de Energia Elétrica**. Inventários hidrelétricos. Disponível em:<https://www2.aneel.gov.br/aplicacoes_liferay/inventario_biblioteca/inventario.cfm>. Acesso em: 30 out. 2023.

BLASENHEIM, P. As Ferrovias em Minas Gerais no século XIX. **Locus: Revista de História**, Juiz de Fora: Núcleo de História Regional / Departamento de História / Arquivo Histórico/EDUFJF, v. 2, n. 2, jul. 1996. Disponível em: <https://periodicos.ufjf.br/index.php/locus/article/view/20429>. Acesso em 29 out. 2023.

BULLARD, R. D. Unequal Protection: **Environmental Justices and Communities of Color**. San Francisco: Sierra Club Books, 1996.

CARNEIRO, P. A. S. **Conquista e Povoamento de uma Fronteira: a Formação Regional da Zona da Mata no Leste da Capitania de Minas Gerais (1694-1835)**. 2008. 295 fls. Dissertação (Mestrado em Geografia) Programa de Pós-graduação do Departamento de Geografia, da Universidade Federal de Minas Gerais, Belo Horizonte, 2008.

CARVALHO, D. **Estudos e Depoimentos**. Rio de Janeiro: Editora José Olímpio, 1953.

CONFLITOS NO CAMPO – BRASIL 2023 / **Centro de Documentação Histórica Dom Tomás Balduíno**. Goiânia: CPT Nacional, 2023.

CRISTÓVÃO, E. C. **A implantação de empreendimentos hidrelétricos: impactos e repercussões socioambientais. O caso da UHE de Barra de Braúna.** Dissertação (Mestrado em Geografia) – Instituto de Ciências Humanas, Programa de Pós-Graduação em Geografia, Universidade Federal de Juiz de Fora, Juiz de Fora, 2014.

FREIRE, P. **Pedagogia da autonomia: saberes necessários à prática educativa**. São Paulo: Paz e Terra, 1996.

FUNDAÇÃO JOÃO PINHEIRO. **Comércio interestadual e internacional**. Belo Horizonte. Disponível em: <https://fjp.mg.gov.br/comercio-interestadual-e-internacional/>. Acesso em: 25 out. 2023.

GALLO, E.; SETTI, A. F. F. Abordagens ecossistêmica e comunicativa na implantação de Agendas territorializadas de desenvolvimento sustentável e promoção da saúde. **Ciência e Saúde Coletiva**, v. 6, n. 17, p. 1433-1446, jun. 2012. Disponível em: <https://www.scielo.br/j/csc/a/RXHtbgKXLj5XvFLcbmKpCSk/?lang=pt>. Acesso em 30 nov. 2023.

GUDYNAS, E. Estado compensador y nuevos extractivismos. **Nueva Sociedad**, n.237, 128-146, fev. 2012. Disponível em: < https://nuso.org/articulo/estado-compensador-y-nuevos-extractivismos-las-ambivalencias-del-progresismo-sudamericano/>. Acesso em: 30 out. 2023.

GUDYNAS, E. Diez tesis urgentes sobre el nuevo extractivismo. In: CAAP & CLAES (Eds.), **Extractivismo, política y sociedade**. Quito: Centro Andino de Acción Popular; Centro Latino Americano de Ecología Social, 2009.

GUIMARÃES, M. Por uma educação ambiental crítica na sociedade atual. **Revista Margens Interdisciplinar**, v. 7, n. 9, p. 11-22, 2013. Disponível em: <https://periodicos.ufpa.br/index.php/revistamargens/article/view/2767>. Acesso em: 20 de dez. 2023.

GUIMARÃES, M. Educação Ambiental crítica. In: MMA/ Secretaria Executiva/ **Diretoria de Educação Ambiental** (Org.). Identidades da Educação Ambiental brasileira. Brasília: MMA, 2004.

HARVEY, D. **O novo imperialismo**. São Paulo: Loyola, 2005.

HENCKE, J.; SILVA, G. R. Educação para o Desenvolvimento Sustentável x Educação Ambiental. **REMEA: Revista Eletrônica do Mestrado em Educação Ambiental,** Rio Grande, v. 39, n. 1, p.73-93, abr. 2022. Disponível em: <https://periodicos.furg.br/remea/article/view/13931>. Acesso em 23 nov. 2023.

HENRIQUES, A. B.; PORTO, M. F. S. A inserção do Brasil no mercado mundial de alumínio: incorporando contribuições da Ecologia Política para a Saúde Coletiva**. Saúde e Sociedade**, São Paulo, v.23, n.2, p.418-431, 2014. Disponível em: <https://www.scielo.br/j/sausoc/a/hY3n6m4b8TbwRFtv9WH7pbc/>. Acesso em 20 nov. 2023.

HENRIQUES, A. B.; PORTO, M. F. S. A insustentável leveza do alumínio: impactos socioambientais da inserção do Brasil no mercado mundial de alumínio primário. **Ciência e Saúde Coletiva**, Rio de Janeiro, n.18, v.11, p.3223-3234, 2013. Disponível em: <https://www.scielo.br/j/csc/a/Spf7PNs9r9JbnY9bPfTZrqf/ >. Acesso em 20 nov. 2023.

HERCULANO, S. Riscos e desigualdade social: a temática da Justiça Ambiental e sua construção no Brasil. **Anais I Encontro da ANPPAS**, Indaiatuba, São Paulo, 2002.

IORIO, G. S.; MAGNO, L. O território corporativo da mineração na Serra do Brigadeiro. **Revista Sapiência: Sociedade, Saberes e Práticas Educacionais**, Iporá, v.8, n.2, p.34-59, dez. 2019. Disponível em: <https://www.revista.ueg.br/index.php/sapiencia/article/view/9811>. Acesso em 04 dez. 2023.

JATOBÁ, S. U. S.; CIDADE, L. C. F.; VARGAS, G. M. Ecologismo, Ambientalismo e Ecologia Política: diferentes visões da sustentabilidade do território. **Sociedade e Estado**, Brasília, v. 24, n.1, p.47-87, jan./abr. 2009. Disponível em: <https://www.scielo.br/j/se/a/CSrVxYphhYvHrgcZgRNF8WF/#>. Acesso em 15 out. 2023.

LEFF, E. Precisamos de uma nova racionalidade. **SENAC e Educação Ambiental**, Rio de Janeiro, v.1, n.1, p.8-12, jan./abr. 2007. Disponível em: <https://www.imasul.ms.gov.br/wp-content/uploads/2016/03/Revista-SENAC-e-Educa%C3%A7%C3%A3o-Ambiental-Ano-16-2007.pdf >. Acesso em 20 out. 2023.

LIMA, G. F. C. **Formação e dinâmica do campo da educação ambiental no Brasil: emergência, identidades, desafios**. 2005. 207 p. Tese (Doutorado) Instituto de Filosofia e Ciências Humanas, Universidade Estadual de Campinas, Campinas, 2005.

LIMA, G. F. C. Educação ambiental crítica: do socioambientalismo às sociedades sustentáveis. **Educação e Pesquisa**, São Paulo, v.35, n.1, p. 145-163, 2009. Disponível em: <https://www.scielo.br/j/ep/a/tSMJ3V4NLmxYZZtmK8zpt9r/>. Acesso em 10 set. 2023.

LOUREIRO, C. F. B. **Educação Ambiental, questões de vida**. São Paulo: Cortez, 2019.

LOUREIRO, C. F. B. **Trajetórias e fundamentos da Educação Ambiental**. 2ª Ed. São Paulo: Cortez, 2006.

LOUREIRO, C. F. B.; LAYRARGUES, P. P. Ecologia Política, Justiça e Educação Ambiental Crítica: perspectivas de aliança contra-hegemônica, **Trabalho Educação e Saúde**, Rio de Janeiro, v. 11 n. 1, p. 53-71, 2013. Disponível em: <https://www.scielo.br/j/tes/a/8VPJg4SGvJLhcK3xcrrnHRF>. Acesso em 10 set. 2023.

MAFFIA, A. M. C. **Impactos ambientais decorrentes da mineração de bauxita e proposição de estratégias de formação docente no entorno do Parque Estadual da Serra do Brigadeiro**. Tese. Pós-graduação em Ciência Florestal, Universidade Federal de Viçosa, 2011.

MARTINEZ-ALIER, J. M. **O Ecologismo dos Pobres**. São Paulo: Contexto, 2007.

MERCADANTE, P. **Os Sertões do Leste**. Cidade, Zahar, 1973.

OLIVEIRA, M. R. Cafeicultura Mineira: formação e consolidação, 1809-1870. In: **IX Seminário sobre economia**. Anais. Belo Horinzonte: UFMG/Cedeplar, p. 257-280, 2000.

PORTO, M. F. S. **Uma Ecologia Política dos Riscos: princípios para integrarmos o local e o global na promoção da saúde ambiental e da justiça ambiental**. Rio de Janeiro: Editora Fiocruz, 2007.

PORTO, M. F. S.; MARTINEZ-ALIER, J. Ecologia política, economia ecológica e saúde coletiva: interfaces para a sustentabilidade do desenvolvimento e para a promoção da saúde. **Cadernos de Saúde Pública**, Rio de Janeiro, v.23, sup.4, p.503-512, 2007. Disponível em: <https://www.scielo.br/j/csp/a/rybyXnQpc9RFYTPvKhq9gyH/abstract/?lang=pt>. Acesso em: 15 out. 2023.

PORTO-GONÇALVES, C. W. **O desafio ambiental**. Rio de Janeiro: Record, 2004.

RBJA. **Rede Brasileira de Justiça Ambiental. Declaração de Princípios da Rede Brasileira de Justiça Ambiental**. Disponível em: <http://www.justicaambiental.org.br/justicaambiental/pagina.php?id=229>. Acesso em: 10 jan. 2023.

RESES, G. L. N. **Educação Ambiental Crítica: enfocando o imaginário de estudantes do ensino fundamental**. Dissertação. Programa de Pós-Graduação em Educação Científica e Tecnológica, da Universidade Federal de Santa Catarina, 2010.

SAINT-HILAIRE, A. Viagem pelas províncias do Rio de Janeiro e Minas Gerais. **Tom**. 1, v. 26, 1ª Ed. SP/RJ/Recife/Porto Alegre: Cia. Editora Nacional, 1938. 394 p. 394.

SANTOS, M. **Espaço e método**. São Paulo: Edusp, 2008.

SILVA, J. C.; IORIO, G. A luta por um território livre de mineração na região da Serra do Brigadeiro (MG). In. MALERBA, M.; WANDERLEY, L. J.; COELHO, T. P. **Territórios livres de mineração: construindo alternativas ao extrativismo**. Brasília: Comitê Nacional em Defesa dos Territórios frente à mineração, 2022.

SILVEIRA, J. M. P. O café e a Estrada de Ferro Leopoldina: uma confluência de interesses - 1874 - 1898. **Revista de Ciências Humanas**, Viçosa, v.9, n.1, p. 107-117, jan./Jun. 2009. Disponível em: <https://periodicos.ufv.br/RCH/article/view/3513>. Acesso em 25 out. 2023.

SOUSA SANTOS, B. **A Gramática do Tempo: para uma nova cultura política**. São Paulo: Cortez, 2010.

TAUNAY, A. E. **História do Café no Brasil, Rio de Janeiro.** Rio de Janeiro: Departamento Nacional do Café, 15 vols. 1939-1945.

TEIXEIRA, R. O. S. **A 'Rua' e o 'Nosso Lugar': processos de reterritorialização no licenciamento da usina hidrelétrica de Murta.** In: Andréa Zhouri. (Org.). As Tensões do Lugar: hidrelétricas, sujeitos e licenciamento ambiental. 1ed. Belo Horizonte: Editora UFMG, 2011, p. 127-150.

VALVERDE, O. Estudo Regional da Zona da Mata, Minas Gerais. **Revista Brasileira de Geografia**, v.1, p. 3-82, 1958. Disponível em: <https://www.rbg.ibge.gov.br/index.php/rbg/article/view/4286/3564#>. Acesso em 15 out. 2023.

VIEIRA, M. R. M.; ZANON, A. M. Environmental education trends and concepts of actions registered in SisEA/MS and carried out in Ladário/MS. **Ambiente & Sociedade**. São Paulo, v. 7, n. 9, p. 11-22, abr. 2023. Disponível em: <https://www.scielo.br/j/asoc/a/3bnDNhHPxc6xjgMnRQm6dcB/>. Acesso em 20 de dez. 2023.

VIEIRA, L. H.; ZANOTELLI, C. L. Novas frentes de mineração, transformações territoriais e conflitos ambientais na Zona da Mata de Minas Gerais. **Terra Livre**, São Paulo, v. 1, n. 58, p. 50-88, dez. 2022. Disponível em: <https://publicacoes.agb.org.br/terralivre/article/view/2327>. Acesso em: 21 nov. 2023.

VISVANATHAN, S. **A Carnival for Science. Essays on Science, technology and development**, Delhi, Oxford, University Press, 1997. 260 p.

ZHOURI, A. **As tensões do Lugar: hidrelétricas, sujeitos e licenciamento ambiental**. Belo Horizonte: Editora UFMG, 2011. 327 p.

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