

Environmental Education as a Foundation for Ecological Citizenship: Convergences among Agroecology, Environmental Rights and Social Participation

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Abstract

Environmental education has increasingly moved beyond the transmission of ecological knowledge toward the development of competencies related to participation, rights awareness, territorial responsibility, and collective action. This study analyzes environmental education as a foundation for ecological citizenship by examining its convergences with agroecology, environmental rights, and social participation. A qualitative documentary review was conducted using academic literature published up to 2023, with priority given to peer-reviewed sources from environmental law, environmental studies, environmental education, agroecology, and socio-legal research. The analysis identified four interrelated dimensions: environmental education as a basis for ecological competence; environmental rights as the normative structure of ecological citizenship; agroecology as a territorial expression of socioecological responsibility; and social participation as the mechanism that transforms knowledge and rights into collective environmental agency. The findings indicate that environmental education is necessary but insufficient when limited to awareness or individual behavior. Its transformative capacity increases when ecological knowledge is linked to environmental rights, access to information, participation in decision-making, territorial practices, and collective organization. Agroecology emerges as a particularly relevant field because it integrates environmental learning with food systems, biodiversity, local knowledge, territorial autonomy, and community action. The study concludes that ecological citizenship should be understood as a multidimensional process based on the interaction among knowledge, rights, responsibilities, territorial practices, and participation. This interdisciplinary framework contributes to a more comprehensive understanding of environmental education as a formative process capable of supporting citizens who can interpret socioecological problems, exercise environmental rights, participate in governance, and contribute to sustainable and socially just territorial transformations.

Keywords: *Environmental Education, Ecological Citizenship, Agroecology, Environmental Rights, Social Participation.*

Introduction

Contemporary environmental crises have transformed the relationship between education, citizenship, and environmental governance into a central concern for sustainable development. Climate change, biodiversity loss, ecosystem degradation, pollution, water insecurity, and the intensification of conflicts over natural resources are no longer exclusively biophysical problems; they are also social, political, legal, and educational challenges. Their complexity requires citizens capable not only of understanding environmental processes but also of critically interpreting the social structures, regulatory frameworks, production systems, and power relations that determine how environmental benefits, risks, and responsibilities are distributed. From this perspective, environmental education cannot be restricted to the transmission of ecological knowledge or the promotion of isolated pro-environmental behaviors. Rather, it must contribute to developing the capacities required for individuals and communities to participate in environmental decision-making and to assume an active role in the protection of common goods and socioecological systems (Dobson, 2007; Hadjichambis & Reis, 2020).

This broader understanding is closely connected to the concept of **environmental or ecological citizenship**, which extends traditional notions of citizenship beyond the relationship between individuals and the State and incorporates responsibilities toward ecosystems, other communities, future generations, and forms of life affected by human decisions. Environmental citizenship therefore involves knowledge, values, attitudes, competencies, rights, duties, and individual and collective practices oriented toward

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environmental sustainability and justice. Education for environmental citizenship consequently seeks to develop the capacity to act within both private and public spheres, encouraging informed participation, critical reflection, collective action, and democratic involvement in environmental matters (Hadjichambis & Paraskeva-Hadjichambi, 2020; Hadjichambis & Paraskeva-Hadjichambi, 2020). Such an approach is particularly significant when environmental problems involve contested interests, unequal access to resources, and asymmetrical capacities to influence public decisions.

The need for this multidimensional perspective is reinforced by the increasingly transversal nature of environmental issues. Environmental questions intersect with culture, economics, territorial development, communication, public policy, education, and social organization, which makes strictly disciplinary interpretations insufficient. González Vallejo (2023) emphasizes this transversal condition by showing that environmental concerns permeate multiple dimensions of contemporary social life and require analytical approaches capable of connecting human activity with its ecological context. Similarly, Sanabria Martínez (2022) argues that environmental deterioration, territorial transformation, regulatory weaknesses, and competing socioeconomic interests require new approaches to sustainability based on environmental awareness, respect for diversity, and institutional and social responsibility. These perspectives support the idea that environmental education should operate as a cross-cutting process through which ecological knowledge acquires social, ethical, political, and territorial meaning.

However, ecological citizenship cannot be fully understood without considering its legal dimension. The recognition of a healthy environment as an autonomous human right has progressively reshaped environmental law by connecting ecological protection with human dignity, intergenerational responsibility, and the effective enjoyment of other fundamental rights. This development is especially relevant in the context of climate change, where conventional human-rights mechanisms may prove insufficient unless environmental principles are incorporated into legal interpretation and institutional action (Cima, 2022). In Latin America and the Caribbean, this evolution has been reinforced by the Escazú Agreement, which articulates access to environmental information, public participation in environmental decision-making, access to justice, capacity-building, and protection of environmental defenders. These procedural rights establish conditions under which citizens can move from being recipients of environmental policies to becoming active participants in environmental governance (Etemire, 2023; ECLAC, 2023).

Participation is therefore not merely an additional component of environmental citizenship but one of its constitutive dimensions. The possibility of questioning development projects, participating in territorial decisions, organizing collectively, accessing environmental information, and demanding accountability determines the practical effectiveness of environmental rights. Research comparing public opposition and social mobilization in Colombia and Chile has shown that collective expression is closely connected with democratic participation and with society's capacity to intervene in decisions that affect communities and territories (Murgas Téllez et al., 2023). At the same time, community-based development requires mechanisms that recognize local actors as participants in decision-making rather than passive beneficiaries of external interventions. Ripoll Rivaldo (2023) demonstrates the relevance of community involvement, empowerment, and territorial articulation in processes aimed at generating sustainable social transformations. Consequently, ecological citizenship depends on educational processes that enable people to recognize themselves as rights-holders, political subjects, and participants in the governance of their territories.

Within this framework, agroecology provides a particularly valuable bridge between ecological knowledge, environmental education, territorial practices, and citizenship. Agroecology has evolved from an approach focused primarily on the ecological management of agricultural systems toward a broader field incorporating food sovereignty, traditional knowledge, social movements, territorial autonomy, collective organization, and alternative models of development. Giraldo and Rosset (2018) describe agroecology as a contested territory in which institutional approaches coexist with transformative projects promoted by social movements. This political and social dimension makes agroecology particularly relevant to ecological citizenship because it connects environmental knowledge with practices through which communities make decisions concerning food, land, biodiversity, production, and the use of natural resources.

Experiences associated with local food systems further illustrate this connection. In their analysis of short food supply chains in Tibasosa, Colombia, Hoyos Chavarro et al. (2022) identify organizational processes that strengthen relationships between producers and consumers and support locally embedded forms of production and commercialization. Such experiences demonstrate that sustainability is not produced exclusively through regulatory instruments or technological change; it also emerges through community organization, cooperation, knowledge exchange, and territorial practices. Likewise, regional development research has emphasized that sustainability requires integrating economic and social policies with territorial characteristics and local capacities rather than reducing development to economic growth alone (Vázquez Vidal & Martínez Prats, 2023).

Despite these conceptual advances, the relevant literature remains considerably fragmented. Environmental education studies frequently concentrate on knowledge, attitudes, and behavioral change; environmental law tends to emphasize substantive and procedural rights; agroecological scholarship examines production systems, territorial struggles, and food sovereignty; while participation studies focus on governance, collective action, or democratic procedures. Less attention has been devoted to examining how these dimensions converge in the formation of ecological citizenship. This fragmentation limits understanding of how environmental learning can translate into the exercise of rights, how legal recognition can become meaningful social participation, and how agroecological knowledge and practices can contribute to citizens' capacity to transform socioenvironmental realities.

Accordingly, this study aims to analyze environmental education as a foundation for ecological citizenship by examining the theoretical and practical convergences among agroecology, environmental rights, and social participation. Through an interdisciplinary perspective, the study seeks to identify the conceptual relationships connecting these fields and to explain how their integration can strengthen environmentally informed, rights-based, participatory, and territorially grounded forms of citizenship. In doing so, the research contributes to overcoming disciplinary fragmentation and provides an analytical framework in which environmental education is understood not merely as a mechanism for environmental awareness, but as a formative process capable of linking ecological knowledge, rights, responsibilities, collective agency, and democratic participation in the pursuit of sustainable and socially just territories.

Methodology

Research Design

The study followed a qualitative, descriptive, and interpretive documentary review design, aimed at identifying and critically integrating the conceptual relationships among environmental education, ecological citizenship, agroecology, environmental rights, and social participation. Documentary research was considered appropriate because it enables the systematic examination, comparison, and synthesis of previously published knowledge while facilitating the identification of conceptual convergences, divergences, and research gaps. Similar documentary and integrative approaches have been applied to interdisciplinary problems requiring the organization of dispersed evidence and the construction of analytical categories (Gómez Miranda, 2023; Machuca-Contreras et al., 2023; Vázquez Vidal & Martínez Prats, 2023).

The methodological procedure was also informed by documentary-review experiences that emphasize the definition of the research topic, establishment of eligibility criteria, structured retrieval of documents, extraction of relevant information, thematic categorization, and synthesis of findings (Del Risco Machado et al., 2023; Román Santana et al., 2023; Santana González et al., 2023).

Search Strategy

The documentary search was conducted in Scopus, Web of Science, SciELO, Dialnet, and Google Scholar, complemented by direct searches in specialized legal, environmental, and interdisciplinary journals. The search combined descriptors in English and Spanish through Boolean operators AND and OR. The main combinations included: *environmental education*, *environmental citizenship*, *ecological citizenship*, *environmental rights*,

right to a healthy environment, environmental justice, environmental democracy, public participation, social participation, agroecology, agroecological transition, territory, and sustainability. The use of descriptors, combinations of keywords, databases, and explicit search criteria is consistent with documentary-review procedures reported in previous studies (Pérez Guedes & Arufe Padrón, 2023; Román Santana et al., 2023).

Because the manuscript was designed for publication in 2024, only documents published up to December 31, 2023 were considered eligible. No references published in 2024 or subsequent years were incorporated into the analytical corpus.

Eligibility Criteria

Sources were included when they: (a) were published in peer-reviewed academic journals or constituted relevant institutional or legal documents; (b) addressed at least one of the central categories of the study; (c) provided theoretical, empirical, legal, or methodological contributions to the relationship between environmental education and citizenship; (d) were available in English, Spanish, or Portuguese; and (e) had sufficient bibliographic information to verify their authenticity and provenance.

Preference was given to publications indexed in recognized academic databases, particularly articles from environmental law, environmental studies, environmental education, agroecology, sustainability, and socio-legal journals. Studies addressing Latin America and Colombia received special analytical attention because of their relevance to the regional development of environmental rights, environmental democracy, and agroecological processes.

Documents were excluded when they were duplicated, lacked verifiable authorship or publication information, were published after 2023, addressed environmental issues only tangentially, or did not contribute directly to the analytical purpose of the study. The application of explicit relevance and temporal criteria follows documentary-selection procedures used in comparable reviews (Rengifo Peña & Ortiz Tobar, 2022; González Ávila et al., 2023).

Data Extraction and Analysis

Each selected publication was registered in a documentary matrix containing the following fields: author(s), year, title, journal or source, geographical context, thematic focus, methodological approach, main contribution, and relationship with the research objective. The use of structured documentary records facilitated traceability and comparative examination of the sources. Documentary matrices and systematic extraction procedures are particularly useful for transforming heterogeneous literature into analytically comparable information (Machuca-Contreras et al., 2023; Santana González et al., 2023).

The analysis was conducted through thematic content analysis and constant comparison. First, the publications were read to identify concepts and arguments related to the study variables. Second, recurrent meanings were grouped into preliminary categories. Third, similarities, differences, complementarities, and conceptual tensions among the sources were compared. Finally, the categories were progressively integrated into broader interpretive dimensions. This procedure is consistent with studies in which documentary evidence is used to organize complex social and environmental phenomena into explanatory categories (Murgas Téllez et al., 2023; Vázquez Vidal & Martínez Prats, 2023).

The analytical process resulted in four guiding dimensions: (1) environmental education and the formation of ecological citizenship; (2) environmental rights, justice, and environmental democracy; (3) agroecology, territory, and socioecological responsibility; and (4) social participation, collective action, and environmental governance. These dimensions were not treated as isolated thematic blocks but as interconnected components through which environmental education may contribute to transforming ecological knowledge into rights awareness, territorial practices, collective agency, and democratic participation.

Methodological Rigor

Methodological rigor was strengthened through source verification, comparison of evidence from different disciplinary fields, preferential use of peer-reviewed literature, and triangulation among educational, legal, environmental, and agroecological perspectives. The analysis sought conceptual convergence without suppressing theoretical disagreements, particularly regarding the scope of ecological citizenship, the anthropocentric or ecocentric foundations of environmental rights, and the political dimensions of agroecology. This interpretive and comparative orientation is consistent with documentary research that moves beyond bibliographic description toward critical synthesis and identification of patterns and differences among studies (Del Risco Machado et al., 2023; Román Santana et al., 2023).

As the research relied exclusively on publicly available documentary sources and did not involve human participants, personal data, or experimental interventions, ethical approval and informed consent were not required. Nevertheless, principles of academic integrity, source traceability, accurate citation, and faithful representation of the reviewed studies were maintained throughout the research process.

Results

The documentary analysis revealed four interrelated thematic dimensions that explain how environmental education contributes to the formation of ecological citizenship: (1) environmental education as a transition from ecological awareness to citizenship competence; (2) environmental rights as the normative foundation of ecological citizenship; (3) agroecology as a territorial expression of environmental citizenship; and (4) social participation as the mechanism that transforms environmental knowledge and rights into collective action. Rather than operating independently, these dimensions form a sequential and mutually reinforcing relationship in which education provides knowledge and critical capacities, environmental law defines rights and responsibilities, agroecology translates them into territorially situated practices, and participation enables their collective exercise.

Environmental education: from ecological awareness to citizenship competence

The first pattern identified in the literature concerns the gradual expansion of environmental education beyond conventional approaches based primarily on awareness, conservation attitudes, and individual behavioral change. Earlier formulations of environmental citizenship already warned that sustainable transformation could not depend exclusively on modifications in individual conduct, because long-term environmental responsibility also involves values, political identities, obligations, and conceptions of justice (Dobson, 2007). Subsequent contributions strengthened this position by demonstrating that environmental citizenship requires an educational process capable of connecting environmental knowledge with public engagement, political understanding, and collective responsibility (Schild, 2016; Hadjichambis & Reis, 2020).

The analyzed literature consistently differentiated between environmentally responsible behavior and environmental citizenship. The former is commonly associated with actions such as recycling, saving water, reducing energy consumption, or adopting sustainable consumption habits, whereas the latter incorporates participation in collective decisions, the exercise of environmental rights and duties, intervention in public affairs, and actions aimed at addressing the structural causes of environmental degradation (Goldman et al., 2020; Parra et al., 2020; Hadjichambis & Paraskeva-Hadjichambi, 2020). Consequently, environmental citizenship does not replace pro-environmental behavior but expands its scope from the private sphere toward the public and political dimensions of environmental action.

This distinction was particularly visible in studies examining formal, non-formal, and participatory environmental learning. Boeve-de Pauw and Halbac-Zamfir (2020) emphasized the importance of non-formal contexts in adapting environmental learning to participants' needs and experiences, while Paraskeva-Hadjichambi et al. (2020) highlighted action competence and youth civic engagement as relevant outcomes of education for environmental citizenship. Similarly, Monte and Reis (2021) proposed pedagogical models in which environmental problems function as contexts for inquiry, reflection, decision-making, and action

rather than merely as scientific content to be learned. These findings indicate that citizenship-oriented environmental education is most consistent when learners are not treated simply as recipients of information but as actors capable of analyzing problems and intervening in their environments.

Empirical evidence reinforces this relationship. Environmental education programs combining direct contact with socioecological problems, participatory activities, and locally situated learning have reported improvements in knowledge, environmental commitment, and the capacity to act. De las Heras Pérez et al. (2021), for example, identified the potential of biodiversity and cultural education programs to strengthen environmental citizenship, while Carson et al. (2021) showed that citizen science experiences may simultaneously contribute to scientific learning and environmental citizenship. Similar relationships between educational experiences and citizenship outcomes had previously been identified by Tarrant and Lyons (2012), although educational interventions do not automatically produce lasting civic action.

Systematic evidence provides an important qualification to these positive findings. Adamou et al. (2021), after examining 31 empirical citizen-science studies, found that participatory environmental initiatives were particularly effective in developing knowledge and skills but less consistently successful in transforming values, attitudes, and public forms of action. A subsequent systematic review of K-12 citizen-science initiatives similarly found positive effects on environmental citizenship competencies but unequal development among knowledge, skills, participation, and broader civic outcomes (Hadjichambi et al., 2023). This indicates a recurrent knowledge–action gap: environmental education may improve environmental literacy without necessarily producing sustained collective or political participation.

The evidence therefore suggests a first central result: environmental education becomes a foundation for ecological citizenship only when environmental literacy is connected with agency, decision-making, rights awareness, responsibility, and opportunities for participation. Knowledge is necessary, but insufficient. Educational processes acquire a citizenship dimension when learners can use ecological knowledge to interpret conflicts, evaluate alternatives, deliberate with others, and intervene in decisions affecting socioecological systems.

Environmental Rights: The Normative Architecture of Ecological Citizenship

A second category emerged around the relationship between citizenship and environmental rights. The literature shows a transition from understanding environmental protection mainly as a governmental responsibility toward recognizing individuals and communities as holders of substantive and procedural environmental rights. This evolution is particularly relevant to ecological citizenship because it changes the position of citizens: they are no longer solely expected to behave responsibly toward the environment but are legally empowered to demand information, participate in decision-making, access justice, and hold institutions accountable.

The growing recognition of the right to a clean, healthy, and sustainable environment provides the substantive basis for this transformation. Cima (2022) argues that the recognition of this right contributes to the reconceptualization of human rights in the context of climate change, while developments in the Inter-American system have strengthened its autonomous and directly justiciable character. Mejía-Lemos (2022), analyzing the *Lhaka Honhat v. Argentina* judgment, identifies the decision as a turning point because the Inter-American Court treated the right to a healthy environment as independently enforceable rather than merely instrumental to traditional civil and political rights.

For ecological citizenship, however, substantive recognition acquires practical relevance only when accompanied by procedural guarantees. The Escazú Agreement reinforces this dimension in Latin America and the Caribbean by connecting environmental protection with three fundamental access rights: environmental information, participation in environmental decision-making, and access to environmental justice. Etemire (2023) emphasizes the central role of environmental information in enabling informed public intervention, while Mesa Neira and Jiménez Lara (2022) identify participation, information, and justice as central implications of Escazú for Colombia. Muñoz Ávila and Lozano Amaya (2021) further

demonstrate that these principles are compatible with and may strengthen the environmental-democratic foundations established by the Colombian Constitution of 1991.

The reviewed evidence consequently points toward environmental democracy as a central institutional condition for ecological citizenship. Rights of access provide mechanisms through which ecological knowledge can become politically effective. A person may understand an environmental problem, but without access to relevant information, institutional participation, and judicial or administrative remedies, such understanding has limited capacity to affect environmental governance. Conversely, procedural guarantees without environmental literacy may formally open participatory spaces while leaving citizens without sufficient capacities to understand technical information or evaluate environmental consequences.

The international literature also reveals that legal recognition does not guarantee effective participation. Lee (2023), examining the relationship between the Aarhus Convention and environmental legislation in England, identified weaknesses associated with the quality, inclusiveness, informational foundations, and actual impact of participatory processes. This finding is significant because it distinguishes formal participation from effective environmental citizenship: consultation mechanisms may exist without providing citizens meaningful influence over final decisions.

The Colombian experience with rights of nature expands this relationship even further. Wesche's (2021) analysis of the Atrato River decision showed that granting rights to natural entities may have effects extending beyond judicial standing, particularly by creating new forms of environmental governance and increasing community participation in ecosystem protection. The case reveals an important shift from exclusively anthropocentric environmental rights toward frameworks in which communities can participate as guardians of ecosystems and biocultural relationships. Nevertheless, the same study emphasizes that legal innovation depends on institutional capacity and policy implementation; judicial recognition alone cannot resolve complex ecological degradation.

A second major result therefore emerges: ecological citizenship possesses an unavoidable legal dimension. Environmental education enables citizens to understand environmental problems; environmental rights determine what citizens may demand and what institutions must guarantee; and procedural rights create channels through which environmental knowledge can become democratic intervention. Environmental literacy and environmental law thus operate as complementary rather than separate dimensions of citizenship.

Agroecology: Territorializing Ecological Citizenship

The third analytical dimension concerns agroecology. The reviewed sources show that agroecology cannot be reduced to a collection of environmentally friendly agricultural techniques. A substantial part of the literature conceptualizes it simultaneously as a scientific field, productive practice, social process, and political movement linked to territorial autonomy, food sovereignty, biodiversity, local knowledge, collective organization, and alternative development models.

Giraldo and Rosset (2018) describe agroecology as a territory in dispute, highlighting tensions between institutional approaches that seek to incorporate agroecological practices into existing systems and social movements that understand agroecology as part of broader transformations in food systems and rural power relations. Research from Brazil similarly shows that agroecological transformation combines institutional reform with the construction of popular movements and the political articulation of local demands for land, alternative production systems, markets, and recognition (Van den Berg et al., 2022).

Colombian evidence is especially relevant to the relationship examined in this study. Acevedo-Osorio and Chohan (2020) demonstrate that agroecology in the Cabrera Peasant Reserve Zone operates not merely as agricultural practice but also as a social movement associated with territorial organization and peasant claims. Likewise, Vallejo Cabrera et al. (2021) explicitly connect environmental citizenship with the territorial scaling of agroecology in the San Isidro Peasant Reserve Zone in Valle del Cauca. Their findings identify social organization, effective agroecological practices, constructivist teaching-learning processes,

mobilizing discourse, alliances, markets, and political opportunities among the drivers that influence agroecological expansion.

The relationship becomes even more explicit in the work of Giraldo-Díaz and Nieto-Gómez (2022), who construct a proposal for environmental citizenship from peasant agroecological practices in Pradera, Colombia. Their empirical results show that the social component plays a particularly important role in this citizenship model, alongside biodiversity, soil, water, and management-system variables. This finding supports an interpretation of agroecology in which environmental citizenship is practiced through decisions regarding land, soil conservation, water, biodiversity, production, community organization, and relationships between households and territories.

The literature additionally emphasizes that agroecological knowledge is strengthened through collective learning rather than exclusively through technical transfer. Pinzón López (2017) identifies collective action as a relevant analytical dimension for understanding agroecological transitions, while participatory research in Mexico and Nicaragua demonstrates how cooperation among farmers, cooperatives, communities, and universities can combine diversification practices, traditional knowledge, food sovereignty, and participatory action research (Guzmán Luna et al., 2022). These processes transform farmers from recipients of agricultural technologies into producers of knowledge and participants in decisions about food systems.

The Colombian Amazon context reinforces the territorial importance of this relationship. Sánchez Castillo et al. (2022), studying rubber-production systems in Caquetá, showed that agricultural production systems must also be examined in relation to food security, household production strategies, land use, and socioeconomic and ecological characteristics. Mancera Rodríguez and Sánchez Sánchez (2022) similarly identify technology, associativity, training, sustainability, and direct connections between rural producers and consumers as factors with potential implications for rural development. These contributions demonstrate that productive systems are embedded in broader social relations and cannot be analyzed solely through productivity indicators.

Other studies reveal tensions that constrain this transformative potential. Productive chains may remain dependent on technological capacity, market access, training, and unequal positions within value chains (Cantillo Velásquez, 2022), while locally based commercialization systems may offer alternatives capable of bringing producers and consumers closer together and reinforcing territorial economies (Hoyos Chavarro et al., 2022). Consequently, agroecological citizenship also entails the capacity to participate in decisions concerning production models, market relations, food systems, and territorial priorities.

The evidence supports a third principal finding: agroecology functions as a practical and territorial arena for ecological citizenship. Through agroecological practices, abstract environmental principles become decisions about soil, seeds, water, biodiversity, food, markets, knowledge, and collective organization. Agroecology therefore provides the bridge through which environmental education can move from conceptual learning toward situated socioecological practice.

Social Participation: From Individual Responsibility To Collective Environmental Agency

The fourth category concerns social participation, which emerged as the mechanism connecting the other three dimensions. Environmental education provides competences, environmental law provides rights, and agroecology provides territorial practices; however, social participation determines whether those elements are converted into collective capacity to influence environmental realities.

Latin American scholarship has long emphasized that environmental citizenship develops under conditions shaped by social conflict, unequal access to resources, territorial identities, and political mobilization. Latta and Wittman (2010) describe environment and citizenship in Latin America as a field in which ecological questions reshape social subjectivities and political relationships, while Orlove et al. (2011) demonstrate the importance of intermediate organizations in connecting environmental information with political subjects and collective responses.

The reviewed Colombian literature confirms that participation becomes especially visible when environmental interests conflict with investment, extraction, or territorial transformation. Murgas Téllez et al. (2023) show how public opposition and social manifestation surrounding investment projects constitute expressions through which communities intervene in matters affecting their territories. Sanabria Martínez (2022), in turn, highlights the interaction among extractive activity, environmental impacts, cultural diversity, regulatory weaknesses, and competing political and economic interests, reinforcing the need to create sustainable local spaces grounded in environmental awareness and respect for living systems.

Participation nevertheless extends beyond protest and institutional consultation. The educational evidence indicates that participatory practices such as citizen science can turn environmental problems into collective learning processes. Adamou et al. (2021) found that citizen-science initiatives can enhance environmental competencies and encourage responsible environmental actions, while Carson et al. (2021) illustrate how locally embedded scientific activities may connect learning, environmental observation, and civic engagement. Hadjichambi et al. (2023) further demonstrate that the participatory architecture of educational initiatives influences their capacity to develop environmental citizenship.

A similar relationship is visible in agro-food systems. Participatory action research with smallholder cooperatives illustrates that farmers' knowledge, experimentation, farmer-to-farmer exchange, and collective decision-making can contribute to transformative agroecology and food sovereignty (Guzmán Luna et al., 2022). Community-supported agriculture has likewise been interpreted as a potential space for practicing ecological citizenship because it can establish relationships of responsibility and cooperation between producers and consumers, although access inequalities and social justice limitations must also be considered (Misra, 2023).

The evidence therefore indicates that participation is both an educational process and an outcome of ecological citizenship. Individuals learn citizenship by participating, but meaningful participation simultaneously requires prior knowledge, access to information, organizational capacity, and recognition of rights. This circular relationship explains why isolated environmental-awareness interventions generally achieve more limited outcomes than educational processes connected with territorial problems and opportunities for collective action.

Integrated analytical synthesis

Taken together, the four categories reveal a progressive relationship that can be represented as:

Environmental education → ecological competence → rights awareness → territorial practice → social participation → ecological citizenship.

The relationship is not strictly linear. Instead, each dimension feeds back into the others. Participation generates new learning; the exercise of rights improves access to environmental information; agroecological practices produce local knowledge; environmental conflicts stimulate organization; and educational processes strengthen the ability of communities to interpret and use legal and political mechanisms.

The reviewed literature therefore supports an understanding of ecological citizenship as a multidimensional capacity to understand, exercise, participate, and transform. Its educational dimension concerns environmental knowledge, critical thinking, values, and action competence (Dobson, 2007; Schild, 2016; Hadjichambis & Reis, 2020; Monte & Reis, 2021). Its legal dimension encompasses environmental rights, duties, information, participation, justice, and institutional accountability (Muñoz Ávila & Lozano Amaya, 2021; Cima, 2022; Mejía-Lemos, 2022; Mesa Neira & Jiménez Lara, 2022; Etemire, 2023). Its territorial dimension is expressed through agroecological practices, food sovereignty, biodiversity protection, and relationships between communities and ecosystems (Giraldo & Rosset, 2018; Acevedo-Osorio & Chohan, 2020; Vallejo Cabrera et al., 2021; Van den Berg et al., 2022; Giraldo-Díaz & Nieto-Gómez, 2022; Guzmán Luna et al., 2022). Finally, its political dimension is manifested through collective action, organization, deliberation, environmental democracy, and intervention in decisions concerning common goods (Latta & Wittman, 2010; Orlove et al., 2011; Wesche, 2021; Murgas Téllez et al., 2023).

The principal result of the review is therefore that environmental education constitutes a necessary but not sufficient foundation for ecological citizenship. Its transformative capacity depends on whether education is able to connect ecological knowledge with environmental rights, agroecological and territorial practices, and effective opportunities for social participation. When these dimensions remain disconnected, environmental education tends to produce awareness or individual behavior; when they converge, it can contribute to citizens capable of understanding socioecological problems, exercising environmental rights and duties, organizing collectively, participating in governance, and transforming the territories in which environmental conflicts and sustainability challenges materialize.

Conclusions

The documentary analysis shows that environmental education constitutes a necessary foundation for ecological citizenship, but its transformative potential depends on whether it moves beyond the transmission of environmental knowledge and the promotion of isolated pro-environmental behaviors. Ecological citizenship requires the development of critical understanding, rights awareness, responsibility, decision-making capacity, and opportunities for collective participation. In this sense, environmental education becomes politically and socially meaningful when it enables individuals and communities to interpret socioecological problems, deliberate about possible responses, and intervene in the decisions that affect their territories.

The study also demonstrates that environmental rights provide the normative framework that allows environmental citizenship to become operational. The right to a healthy environment, access to environmental information, participation in decision-making, and access to justice strengthen the position of citizens as active subjects rather than passive recipients of environmental policy. However, the existence of legal guarantees does not automatically result in effective ecological citizenship. Their practical value depends on citizens having sufficient environmental literacy, institutional knowledge, organizational capacity, and real opportunities to exercise those rights.

Agroecology emerges as a particularly relevant territorial expression of ecological citizenship because it connects environmental learning with concrete decisions concerning soil, water, biodiversity, food systems, production, local knowledge, and community organization. Its importance lies not only in the adoption of environmentally sustainable agricultural practices, but also in its capacity to strengthen territorial autonomy, collective learning, cooperation, food sovereignty, and the participation of rural communities in defining alternative development pathways. Agroecology therefore represents a practical field in which ecological responsibility, rights, knowledge, and citizenship can converge.

Social participation constitutes the articulating mechanism among these dimensions. Environmental education develops capacities; environmental law provides rights and institutional channels; agroecology offers territorially grounded practices; and participation transforms these resources into collective environmental agency. The findings therefore support an understanding of ecological citizenship as a multidimensional process based on the interaction among knowledge, rights, territorial practices, responsibilities, and collective action.

Accordingly, the principal contribution of this study is the identification of a convergent analytical framework in which environmental education, environmental rights, agroecology, and social participation should not be treated as separate fields. Their integration provides a more comprehensive explanation of how ecological citizenship can be formed and exercised. From this perspective, environmental education should be designed not only to create environmentally informed individuals, but also to support citizens capable of defending environmental rights, participating in governance processes, engaging in territorial transformation, and assuming shared responsibility for socioecological sustainability.

Finally, the study suggests that future research should examine these relationships through empirical and comparative designs capable of assessing how environmental education actually influences the exercise of rights, participation, and agroecological practices in specific territories. Particular attention should be given to rural and environmentally vulnerable communities, where ecological conflicts, unequal access to

resources, and territorial pressures make the relationship between education, citizenship, rights, and sustainability especially significant.

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