

Environmental Education as a Social Right: A Qualitative Review of Environmental Citizenship and Biodiversity Conservation

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Abstract

Environmental education has traditionally focused on ecological knowledge, environmental awareness, and pro-environmental behaviour. However, biodiversity loss, environmental justice, and the recognition of environmental rights have broadened its social and civic significance. This article analyzes the relationships between environmental education as a social right, environmental citizenship, and biodiversity conservation through a qualitative documentary review of scientific literature published up to 2023. Peer-reviewed studies and academic publications addressing environmental education, rights, citizenship, participation, justice, and biodiversity conservation were examined through thematic content analysis. Findings reveal a shift from knowledge transmission and individual behavioural change toward approaches emphasizing socio-ecological literacy, agency, participation, collective responsibility, and environmental citizenship. Environmental knowledge alone does not necessarily generate conservation action; its transformative potential depends on connections with nature, locally meaningful experiences, opportunities for participation, and capacities for individual and collective action. Although environmental education is not universally recognized as an autonomous human right, the literature supports its interpretation as an enabling dimension for exercising interconnected educational and environmental rights. Biodiversity conservation thus emerges as a collective socio-ecological responsibility, with environmental education contributing to the knowledge, agency, ethical responsibility, and participatory capacities required for meaningful environmental citizenship, while connecting human rights, social participation, and ecological integrity.

Keywords: *Environmental Education, Environmental Citizenship, Environmental Rights, Biodiversity Conservation, Environmental Justice, Socio-Ecological Literacy, Human–Nature Relationships.*

Introduction

The accelerating deterioration of ecosystems has transformed biodiversity loss from an issue traditionally confined to conservation science into a multidimensional challenge involving education, citizenship, social participation, justice, and human rights. Changes in land use, population growth, climate change, pollution, and the unsustainable exploitation of natural resources increasingly affect both ecological integrity and the ecosystem services on which human societies depend (Børresen et al., 2023). Within this context, biodiversity conservation cannot be understood exclusively as a technical responsibility of governments, scientists, or environmental organizations. It also depends on the capacity of individuals and communities to understand socio-ecological processes, recognize their relationship with nature, participate in environmental decision-making, and translate knowledge into individual and collective action.

Environmental education has consequently evolved beyond approaches centred primarily on the transmission of ecological information. Contemporary research increasingly conceptualizes it as a process capable of developing knowledge, values, competencies, agency, participation, and environmentally responsible action. A systematic review of 105 studies found that environmental education programmes generated positive cognitive, affective, behavioural, and, in some cases, direct conservation outcomes, particularly when interventions addressed locally relevant environmental problems, involved collaboration among social actors, and incorporated opportunities for action (Ardoín et al., 2020). This evidence suggests that environmental education can operate as an interface between knowledge and environmental action rather than merely as a mechanism for increasing awareness.

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This relationship becomes particularly significant in the context of biodiversity conservation. Although knowledge alone does not necessarily produce pro-environmental behaviour, educational processes can influence how people understand biodiversity, ecosystem services, and their own relationship with ecological systems. Research conducted in communities located close to protected areas has shown that educational interventions can modify knowledge and attitudes toward biodiversity and ecosystem services, although their effects are conditioned by socioeconomic circumstances and relationships between local livelihoods and natural resources (Børresen et al., 2023). Similarly, studies examining environmental education and biodiversity conservation indicate that insufficient knowledge can limit the incorporation of conservation practices into everyday life, reinforcing the need for educational processes that connect ecological understanding with practical and socially meaningful action (Amoah & Addoah, 2022).

The implications of environmental education, however, extend beyond conservation behaviour. An important strand of the literature has connected environmental learning with the concept of environmental citizenship, understood as the exercise of rights and responsibilities and as individual and collective participation in addressing environmental problems. Dobson (2007) argued that environmental citizenship differs from approaches based exclusively on incentives or behavioural regulation because it incorporates questions of responsibility, justice, and the relationship between private conduct and collective environmental consequences. Subsequent developments in Education for Environmental Citizenship have expanded this perspective by proposing educational processes capable of enabling citizens to act in both private and public spheres and at local, national, and global scales (Hadjichambis & Paraskeva-Hadjichambi, 2020).

Empirical research has strengthened this connection between environmental education and citizenship. Hadjichambis et al. (2022), for example, found that pedagogical interventions explicitly grounded in Education for Environmental Citizenship can contribute to the development of knowledge, attitudes, skills, values, and actions associated with environmental citizenship. Likewise, a systematic review of environmental Citizen Science initiatives identified participatory educational experiences as potential mechanisms for empowering learners to become environmental citizens, particularly when learning incorporates authentic participation and opportunities for environmental action (Hadjichambi et al., 2023). These findings reinforce a conceptual transition from education *about* environmental problems toward education that enables people to participate in their transformation.

This transition also entails recognizing that environmental problems are inseparable from questions of equity and social justice. Environmental education cannot be reduced to encouraging individual behavioural changes while overlooking the political, economic, cultural, and institutional structures through which environmental benefits and burdens are distributed. Research on environmental justice education has consequently emphasized pedagogical approaches capable of making structural inequalities visible, promoting systems thinking, strengthening agency, and connecting learning with community engagement (Cachelin & Nicolosi, 2022). Reddy (2021) similarly argues that meaningful environmental learning requires attention to social justice and to the local contexts in which environmental knowledge is produced and applied. From this perspective, environmental education becomes simultaneously ecological, social, ethical, and civic.

The relationship between education and citizenship becomes particularly relevant when environmental action is examined through the lens of civic engagement. A systematic mixed-studies review of 56 environmental education programmes found outcomes associated with civic attitudes, civic knowledge, civic skills, community learning, resilience, partnership building, and social capital. The programmes most consistently associated with civic engagement emphasized local communities, participatory and experiential learning, opportunities for taking action, the development of cognitive skills, and sustained social interaction (Ardoin et al., 2023). Environmental education can therefore contribute not only to what individuals know about environmental problems but also to their capacity to participate collectively in addressing them.

Parallel to these developments in environmental education, international environmental law and human-rights scholarship have progressively strengthened the relationship between human well-being and

environmental quality. Environmental rights have developed through their incorporation into national constitutions and regional instruments, the environmental interpretation of established human rights, and procedural guarantees involving access to environmental information, participation, and justice (Knox, 2020). This trajectory reached an important milestone with the recognition by the United Nations Human Rights Council in 2021 and the United Nations General Assembly in 2022 of the human right to a clean, healthy, and sustainable environment (Limon, 2022; Tang & Spijkers, 2022). This recognition reinforces the proposition that environmental conditions are not external to human rights but constitute part of the conditions required for human dignity and well-being.

This rights-based development creates an important conceptual space for reconsidering environmental education. If individuals and communities are expected to participate meaningfully in environmental governance, exercise environmental rights, assume environmental responsibilities, and contribute to biodiversity conservation, access to the knowledge, competencies, and deliberative capacities required for such participation becomes increasingly relevant. Environmental education can therefore be examined not only as a pedagogical strategy for producing desirable environmental behaviours but also as an enabling condition for the effective exercise of environmental citizenship. Such an interpretation shifts attention from asking whether education simply increases environmental awareness toward examining whether people possess the capabilities required to understand environmental problems, participate in decisions, defend environmental interests, and contribute collectively to ecological protection.

This distinction is particularly important because the relationship between environmental education and conservation is neither automatic nor linear. Increased knowledge does not necessarily translate into environmental action, and environmental awareness does not by itself guarantee participation or conservation outcomes. Evidence instead suggests that environmental education becomes more transformative when knowledge is connected with participation, local relevance, social interaction, collective action, and opportunities to exercise agency (Ardoin et al., 2020, 2023). Similarly, environmental citizenship approaches suggest that environmental responsibility extends beyond individual consumption choices toward participation in the social and institutional processes through which environmental problems are produced and addressed (Dobson, 2007; Hadjichambis & Paraskeva-Hadjichambi, 2020).

Despite these conceptual advances, the literature remains fragmented across several fields. Research on environmental education frequently concentrates on knowledge, attitudes, competencies, and behavioural outcomes; conservation literature examines the contribution of education to biodiversity protection; environmental citizenship scholarship emphasizes participation, responsibility, and civic action; while environmental law and human-rights research examines the progressive recognition of environmental rights. These bodies of knowledge are closely related, but their intersections have received less integrative attention. In particular, there remains a conceptual need to examine whether environmental education can be understood as a social right—or as an enabling dimension of interconnected educational and environmental rights—and how such an interpretation relates to environmental citizenship and biodiversity conservation.

Accordingly, this study addresses the following research question: How has the scientific literature conceptualized the relationship between environmental education as a social right, environmental citizenship, and biodiversity conservation? Rather than assuming that environmental education constitutes an autonomous and universally established right, the review critically examines the arguments, conceptual connections, and tensions through which education, environmental rights, citizenship, participation, and biodiversity conservation have been articulated in the literature.

The objective of this article is therefore to analyze, through a qualitative review of the scientific literature published up to 2023, the conceptual relationships between environmental education as a social right, environmental citizenship, and biodiversity conservation, identifying the principal theoretical approaches, convergences, tensions, and knowledge gaps that structure this emerging field of inquiry. By integrating perspectives that have frequently developed in parallel, the study seeks to contribute an interdisciplinary framework for understanding environmental education not only as a means of transmitting ecological knowledge but as a process through which individuals and communities may develop the capabilities

required to participate in the protection of biodiversity and the construction of more environmentally responsible societies.

Methodology

This study adopted a qualitative documentary review design aimed at interpreting how the scientific literature has conceptualized the relationships among environmental education as a social right, environmental citizenship, and biodiversity conservation. Rather than seeking to quantify publication trends, the review focused on identifying conceptual approaches, convergences, tensions, and knowledge gaps within the selected literature.

The documentary search was conducted in Scopus and Web of Science (WoS), complemented by Google Scholar for the identification and verification of relevant studies not retrieved in the primary databases. The search covered publications available up to December 31, 2023, thereby establishing a temporal cut-off consistent with the study period. Search equations combined terms such as “*environmental education*,” “*environmental right*,” “*social right**,” “*environmental citizenship*,” “*biodiversity conservation*,” “*environmental justice*,” “*environmental participation*,”* and “*right to a healthy environment*”, using Boolean operators AND and OR.

Studies were included when they: (a) were published in peer-reviewed scientific journals or academic books and book chapters from recognized publishers; (b) were published in English, Spanish, or Portuguese; (c) addressed at least two of the central analytical dimensions—environmental education, environmental rights, environmental citizenship, or biodiversity conservation; and (d) provided theoretical, empirical, or review-based contributions relevant to the research question. Duplicate records, publications without accessible full text, documents lacking a clear relationship with the analytical categories, purely technical conservation studies without an educational or social dimension, and publications dated after 2023 were excluded.

The review was conducted in four stages: identification of potentially relevant documents; screening of titles and abstracts; full-text assessment according to the inclusion and exclusion criteria; and qualitative analysis of the final documentary corpus. For each selected document, information concerning objectives, theoretical perspective, methodological approach, principal findings, and conceptual contributions was extracted into an analytical matrix.

The qualitative analysis followed a thematic content analysis combining deductive and inductive coding. Four initial categories derived from the research question guided the analysis: environmental education as a social right, environmental citizenship, biodiversity conservation, and society–nature relationships. Emerging categories were subsequently incorporated when recurrent patterns appeared across the literature, particularly those associated with environmental justice, participation, agency, responsibility, and socio-ecological knowledge. Finally, relationships among categories were interpreted comparatively to identify dominant approaches, conceptual tensions, areas of convergence, and research gaps, providing the basis for an integrative interpretation of environmental education as an enabling dimension of environmental citizenship and biodiversity conservation.

Results

The qualitative analysis revealed that the relationship among environmental education, environmental citizenship, environmental rights, and biodiversity conservation has been progressively constructed through several interconnected but not fully integrated bodies of literature. Four major analytical patterns emerged: (1) the transition from environmental knowledge to action competence; (2) the expansion of environmental education toward citizenship and collective participation; (3) the incorporation of rights, justice, and responsibility into environmental learning; and (4) the recognition of biodiversity conservation as a socio-ecological process requiring transformations in human–nature relationships. Together, these categories reveal a conceptual movement from an instrumental understanding of environmental education toward a rights-based and citizenship-oriented perspective.

From Environmental Knowledge to Environmental Action

One of the most consistent findings is the gradual abandonment of the assumption that environmental knowledge automatically generates environmentally responsible behaviour. Early research had already demonstrated that responsible environmental action depends on multiple variables, including knowledge of environmental issues, knowledge of action strategies, attitudes, locus of control, personal responsibility, and intention to act (Hines et al., 1987). This multidimensional interpretation was reinforced by the action competence approach, which argued that environmental education should enable learners to understand environmental problems while developing their capacity to participate in their resolution (Jensen & Schnack, 1997).

Subsequent research strengthened this distinction between knowing and acting. Environmental sensitivity has been associated with significant experiences involving nature, social relationships, education, and opportunities for participation (Chawla, 1998), while connection to nature has emerged as an important predictor of environmentally responsible behaviour (Mayer & Frantz, 2004; Frantz & Mayer, 2014). Evidence involving children similarly indicates that stronger connections with nature are associated with a greater probability of conservation behaviour (Richardson et al., 2018). Environmental education therefore operates through cognitive, affective, experiential, and behavioural dimensions rather than through knowledge transmission alone.

This multidimensionality is also reflected in environmental literacy. Contemporary instruments incorporate ecological knowledge together with cognitive skills, hope, and behaviour, suggesting that literacy involves the ability and disposition to make informed environmental decisions (Szczytko et al., 2019). Likewise, conservation education has progressively incorporated experiential learning, critical thinking, community participation, and action-oriented approaches (Jacobson et al., 2006; Thomas et al., 2019). These findings challenge educational models based predominantly on information provision.

The systematic review conducted by Ardoin et al. (2020) provides particularly relevant evidence. Across 105 studies, environmental education was associated with cognitive and affective outcomes, behavioural changes, community capacity, environmental actions, and, less frequently, directly measurable ecological outcomes. Programs reporting conservation outcomes tended to incorporate locally relevant issues, collaboration with scientists and communities, opportunities for action, and explicit mechanisms for assessing environmental effects. Accordingly, the reviewed literature supports a transition from environmental knowledge toward environmental capability, in which learning becomes meaningful when individuals possess opportunities and competencies to intervene.

Environmental Education as A Pathway to Environmental Citizenship

A second analytical pattern concerns the transition from individual environmental behaviour toward citizenship. Environmental citizenship expands the scope of environmental responsibility by locating environmental action within private, social, and political spheres. Dobson (2007) distinguished environmental citizenship from approaches centred exclusively on behavioural incentives, arguing that durable environmental responsibility requires consideration of justice, obligations, and the consequences of individual and collective actions.

This perspective has subsequently been developed through Education for Environmental Citizenship (EEC), which understands citizens as actors capable of exercising environmental rights and duties, identifying structural causes of environmental degradation, and participating individually and collectively through democratic means (Hadjichambis et al., 2020; Parra et al., 2020). From this perspective, education acquires a civic function: it must provide not only environmental information but also competencies for participation, deliberation, decision-making, and action.

The literature identifies environmental sensitivity, ecological understanding, investigation skills, awareness of justice, and active participation as important components that can be developed from formal education (Činčera et al., 2020). Similar arguments have been extended to secondary and non-formal education, where

curriculum design, teacher preparation, participatory pedagogies, and opportunities for action determine whether environmental issues become subjects for passive learning or civic engagement (Gericke et al., 2020; Paraskeva-Hadjichambi et al., 2020).

Empirical evidence supports this conceptual development. Hadjichambis and Paraskeva-Hadjichambi (2020) propose a pedagogical model connecting knowledge, values, competencies, participation, and action, while the Environmental Citizenship Questionnaire operationalizes environmental citizenship through dimensions extending beyond attitudes to include competencies and present and future actions (Hadjichambis & Paraskeva-Hadjichambi, 2020). An educational intervention evaluated by Hadjichambis et al. (2022) subsequently demonstrated significant gains in environmental citizenship competencies and intended actions.

The strongest synthesis is provided by Ardoin et al. (2023). Their systematic review of 56 studies identified outcomes including civic knowledge, attitudes and skills, community learning, resilience, partnerships, and social capital. Five recurring characteristics supported civic engagement: connection with local communities, participatory and experiential learning, incorporation of action, development of cognitive skills, and meaningful social interaction. Environmental education therefore appears to acquire greater transformative potential when learners cease to be recipients of information and become participants in environmental processes.

From Environmental Citizenship to Environmental Rights and Justice

The third pattern reveals a convergence between environmental education and the development of environmental rights. Environmental human-rights scholarship shows that the relationship between environmental quality and human rights has progressively developed through constitutional and regional environmental rights, the environmental interpretation of established human rights, and procedural rights involving access to information, participation, and justice (Knox, 2020).

The recognition of the right to a clean, healthy, and sustainable environment by the United Nations Human Rights Council in 2021 and the General Assembly in 2022 consolidated this trajectory (Limon, 2022). The relevance for environmental education lies not in establishing education itself as an automatically autonomous environmental right, but in recognizing an important functional relationship: exercising environmental rights requires access to information, understanding of socio-ecological problems, capabilities for participation, and opportunities to intervene in environmental decisions.

The reviewed educational literature reinforces this interpretation. Environmental citizenship explicitly incorporates the capacity to exercise environmental rights and duties (Parra et al., 2020), while environmental justice education emphasizes that ecological problems cannot be separated from inequalities in power, access to resources, decision-making, and exposure to environmental harm. Cachelin and Nicolosi (2022) show that transformative environmental justice education requires community engagement and pedagogies capable of connecting environmental knowledge with structural conditions. Reddy (2021) similarly argues for environmental learning grounded in social justice and local contexts.

Consequently, environmental education cannot be reduced to modifying individual consumption patterns. A rights-based interpretation requires attention to who has access to environmental knowledge, whose knowledge is recognized, who participates in decisions, and whose interests and territories are affected. This also explains the growing recognition of Indigenous and traditional ecological knowledge. Nesterova (2020) demonstrates that incorporating Indigenous ways of knowing can simultaneously strengthen environmental learning, cultural identity, human–nature relationships, and processes of decolonization. Place-based approaches similarly emphasize community knowledge and social capital as resources for environmental learning and behaviour (Dentzau, 2018).

The synthesis therefore reveals a conceptual chain connecting environmental education → capabilities → participation → environmental citizenship → exercise of environmental rights. Education does not replace

legal guarantees; rather, it provides part of the cognitive, ethical, and participatory infrastructure necessary for those guarantees to become socially exercisable.

Biodiversity Conservation as a Collective Socio-Ecological Responsibility

The fourth pattern concerns biodiversity. Conservation education has historically emphasized knowledge of species, ecosystems, and threats, but the literature increasingly demonstrates that conservation requires a broader understanding of human–nature relationships. Biodiversity education itself has long been recognized as pedagogically complex because biodiversity combines scientific, ethical, economic, cultural, and political dimensions (Gayford, 2000).

Empirical studies reinforce this complexity. Educational interventions can improve knowledge of native fauna (Salas-López, 2021), while conservation-oriented programs can increase environmental knowledge, attitudes, and willingness to act (Sellmann & Bogner, 2013; Williams et al., 2018). However, awareness does not necessarily produce conservation practices. Research in Ghana found that knowledge concerning biodiversity remained insufficient to ensure incorporation of conservation practices into daily life (Amoah & Addoah, 2022). Similarly, Børresen et al. (2023) found that education can influence perceptions of biodiversity and ecosystem services, but that attitudes are mediated by socioeconomic conditions and relationships with natural resources.

This explains why conservation education increasingly incorporates local knowledge, cultural context, place, participation, and experience. Place-based and community-oriented education connects biodiversity with territories and lived experience (Dentzau, 2018), while island environmental education illustrates the importance of relational, Indigenous, socio-affective, and action-oriented pedagogies (Selby & Kagawa, 2018). Citizen science offers another pathway by transforming learners from observers into participants in knowledge production and environmental action. The systematic review by Hadjichambi et al. (2023) indicates that environmental citizen-science initiatives can contribute to students' environmental citizenship when participation is pedagogically meaningful.

The relationship between education and conservation therefore appears to be mediated by at least four dimensions: knowledge, which enables ecological understanding; connection, which constructs affective relationships with nature; agency, which develops the capacity to act; and citizenship, which situates action within collective rights and responsibilities. Collective action is particularly relevant because sustainability challenges exceed the capacity of isolated individual behaviour. Ardoin et al. (2023) argue that environmental literacy must consequently be connected with collective action to address complex sustainability problems.

An Emerging Integrative Interpretation

Taken together, the findings reveal that the four analytical categories initially established for this review are not independent. Environmental education connects socio-ecological knowledge with the development of competencies; environmental citizenship transforms those competencies into possibilities for individual and collective participation; environmental rights provide a normative framework for participation, information, justice, and environmental quality; and biodiversity conservation constitutes one of the ecological domains in which these capacities and responsibilities materialize.

The literature nevertheless remains fragmented. Conservation studies frequently measure knowledge, attitudes, or individual behaviour, while environmental citizenship research concentrates on competencies and civic participation, and environmental-rights scholarship primarily examines legal recognition and procedural guarantees. Relatively few studies explicitly integrate these three traditions. Furthermore, direct ecological outcomes remain considerably less studied than cognitive and behavioural outcomes (Thomas et al., 2019; Ardoin et al., 2020), and relationships between education, collective action, and structural transformation remain less developed than individual-level explanations.

The qualitative synthesis therefore supports a conceptual interpretation in which environmental education may be understood as an enabling social right rather than merely an instrument for behavioural change. Its significance lies in enabling people to understand socio-ecological realities, develop relationships of responsibility toward nature, participate in environmental decisions, exercise environmental rights, and undertake individual and collective conservation action. Under this interpretation, biodiversity conservation is not the terminal result of a linear sequence from knowledge to behaviour; it is a socially constructed process mediated by literacy, connection to nature, agency, justice, participation, and environmental citizenship. This intersection constitutes the principal conceptual space in which environmental education, environmental rights, and biodiversity conservation converge.

Conclusions

Environmental education cannot be reduced to the transmission of ecological knowledge or to the promotion of individual pro-environmental behaviours. The literature reviewed demonstrates a progressive conceptual shift toward an educational process that develops socio-ecological understanding, critical thinking, agency, participation, and the capacity for collective action. From this perspective, its contribution to biodiversity conservation does not follow a linear sequence in which greater knowledge necessarily produces greater conservation. Rather, environmental education contributes to conservation when knowledge is articulated with connection to nature, locally meaningful experiences, opportunities for participation, and the capacity of individuals and communities to intervene in the socio-environmental processes that affect their territories.

The convergence between environmental education, environmental citizenship, and environmental rights provides the central conceptual contribution of this review. Although the literature available up to 2023 does not support defining environmental education as a universally recognized autonomous human right, it does provide grounds for understanding it as an enabling dimension for the effective exercise of interconnected educational and environmental rights. Exercising the right to a clean, healthy, and sustainable environment requires more than its formal legal recognition: citizens must have access to environmental knowledge and develop the capacities required to understand environmental problems, participate in decision-making, demand accountability, deliberate about competing interests, and assume individual and collective responsibilities. In this sense, environmental education acquires a social and civic dimension that transcends the classroom and becomes part of the conditions necessary for meaningful environmental citizenship.

Finally, biodiversity conservation emerges from the reviewed literature as a collective socio-ecological responsibility rather than an exclusively scientific, governmental, or individual undertaking. This interpretation challenges educational approaches that place the burden of environmental change primarily on personal behaviour while overlooking inequalities, institutional arrangements, cultural diversity, traditional and Indigenous knowledge, and the structural drivers of environmental degradation. The principal challenge for environmental education is therefore not simply to produce environmentally informed individuals, but to contribute to societies capable of understanding their interdependence with nature and collectively participating in its protection. From an ecohumanist perspective, this implies overcoming the separation between human well-being and ecological integrity: protecting biodiversity and guaranteeing people's capacity to understand, participate in, and influence environmental decisions constitute mutually dependent dimensions of building socially just and ecologically sustainable societies.

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