

ENVIRONMENTAL EDUCATION AS A MEANS OF SUSTAINABLE AND RESPONSIBLE TOURISM DEVELOPMENT

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ABSTRACT

The development of global and national tourism faces serious challenges related to environmental degradation due to unsustainable mass tourism practices. This study aims to analyze the strategic contribution of environmental education to the development of sustainable and responsible tourism in Indonesia. The research uses a qualitative approach with a systematic literature review method, based on the perspective of environmental sociology and critical education. The data sources consist of scientific journal articles, academic books, policy reports, as well as relevant case studies, collected through databases such as Scopus, Google Scholar, and DOAJ. The data collection technique is carried out through thematic tracing, while the data analysis is carried out interpretively with a thematic approach. The results of the study show that environmental education is able to increase ecological awareness, form ethical tourism behavior, and strengthen the conservation of local natural resources and culture. Implementation challenges include limited resources, resistance from industry players, and lack of policy support. However, community-based and participatory educational approaches have proven effective in a number of tourist destinations. The conclusions of this study affirm the importance of integrating environmental education in tourism management policies, curricula, and practices to support more equitable, inclusive, and sustainable development.

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INTRODUCTIONS

The development of the global tourism industry is currently facing serious challenges related to the negative impact of mass tourism. The phenomenon of over-tourism, which is characterized by a surge in the number of visitors in certain destinations, leads to environmental degradation, poor waste management, and increased carbon emissions.

The researchers underline that unplanned tourism practices can damage the local climate and threaten the sustainability of ecosystems. In this context, the importance of sustainability principles in tourism development has become even more relevant, especially after the impact of the COVID-19 pandemic that forced us to rethink the way we manage the sector. To meet these challenges, transformation efforts towards sustainable tourism are important, in line with the United Nations' Sustainable Development Goals (SDGs), especially Goals 13 (Climate Change), 14 (Underwater Life), and 15 (Life on Land). (Sayeda, 2017) (Akadiri et al., 2021; Tian, 2023) (Černá et al., 2022; Putri et al., 2023) (Putri et al., 2023)

In Indonesia, tourism is a vital sector that describes natural and cultural wealth, the main examples being Bali, Labuan Bajo, and Lake Toba, all of which are highly vulnerable to overexploitation. Although tourism has the potential to drive economic growth, a lack of environmental awareness among tourists and industry players is leading to the rapid degradation of natural resources. Research shows that destination management practices that minimally consider environmental principles contribute to ecosystem damage and potentially reduce destination attractiveness in the long term. (Putri et al., 2023) (Mufidah & Hadiani, 2025) (Ehigiamusoe et al., 2023; Nga et al., 2018a)

Environmental education can serve as a strategic tool in encouraging behavioral change and critical awareness about the environment. This concept is based on the thinking of Paulo Freire who emphasizes the importance of education as a means of liberation and social change. Through education, individuals can understand the importance of sustainability and contribute to conservation efforts while still considering tourism economic development. Educational programs in the tourism sector, both in formal contexts such as in schools and colleges and in informal contexts through workshops and community campaigns, have proven effective in introducing sustainable practices to tourists and industry players. (Muneenam & Suwannattachote, 2024) (Candia et al., 2018) (Geng et al., 2020; Sharma, 2021)

For example, many higher education institutions in Indonesia are now starting to integrate curricula that emphasize sustainability and environmental awareness. In addition, local initiatives involving communities in conservation programs also demonstrate effective ways of engaging communities to reduce the negative impacts of tourism. Through increased awareness and knowledge of the environment, stakeholders can take more responsible actions in the management of destinations and resources. (Suyono & Nugraha, 2024) (Ağazade, 2023) (Ouattara et al., 2019)

Synergy between environmental education and sustainable tourism development must be pursued to achieve a balance that is beneficial for all parties. This will not only help reduce the negative impact of massive tourism but will also provide long-term benefits to the local economy and biodiversity. Therefore, a tourism management strategy that involves environmental education will present a new paradigm that is more responsible and sustainable. (Eslami et al., 2018; Rashid et al., 2020)

Environmental education in Indonesia faces significant challenges, especially in examining its relationship with responsible tourism practices. Although some research has been conducted on the impact of tourism on the environment, there is still a lack of studies that systematically link environmental education with sustainable tourism development in the local context of Indonesia. The lack of adequate literature review raises the urgent need to identify effective environmental education models in the tourism sector, as well as the supporting and inhibiting factors of their implementation. For example, research shows that the integration of environmental education in tourism destination management strategies can increase environmental awareness among tourists and industry players. (Liu et al., 2019; Putri et al., 2023) (Li & Norimah, 2024) (Andi & Yi, 2025; Rumanti et al., 2024)

In the Indonesian context, the challenges of implementing environmental education are very complex, as they are influenced by many factors such as local culture, government policies, and community participation. Most of the current educational process still focuses on theoretical aspects without involving real practices that can increase environmental awareness in the tourism community. The relevance of global research results to the local context also needs to be further explored. The obligation to adapt educational methodology to the specific needs of the region and the characteristics of local tourism will greatly determine the success of the environmental education program. (Mufidah & Hadiani, 2025; Suyono & Nugraha, 2024) (Rico et al., 2019) (Ouattara et al., 2019; Putri et al., 2023)

The scope of this research aims to answer the formulation of problems related to the contribution of environmental education to the development of sustainable and responsible tourism in Indonesia. By analyzing the roles, approaches, and challenges of environmental education through a comprehensive literature review, it is hoped that it can provide deeper insights into the ways in which education can build a more environmentally conscious tourism system. The results of this research are not only expected to provide recommendations to destination managers, but also for policymakers and educators in designing a curriculum that focuses on sustainability and environmental conservation in the tourism sector. (Černá et al., 2022) (X. Chen et al., 2023; Zhao & Li, 2018)

The purpose of this study is to examine in depth the strategic role of environmental education in encouraging the development of sustainable and responsible tourism in Indonesia. This research aims to identify the contribution of environmental education in shaping ecological awareness, encouraging ethical tourism behavior, and strengthening the conservation of local natural resources and culture. In addition, the study also aims to explore effective educational approaches, analyze implementation challenges at the local level, and provide recommendations for relevant educational policies and practices for stakeholders in the tourism sector. With a systematic literature review approach, this research is expected to provide a conceptual and practical foundation in integrating sustainability principles into the education system and management of tourist destinations in Indonesia.

RESEARCH METHOD

This research uses a qualitative approach with a systematic literature review method based on the perspective of environmental sociology, critical education, and sustainable development studies. This approach was chosen because it is in line with the research objective of understanding in depth the relationship between environmental education and sustainable tourism practices through a critical analysis of various relevant scientific literature. As a literature study, this study does not involve the collection of primary data, but focuses on a comprehensive review of literature sources that discuss the relationship between education, environmental awareness, community participation, and responsible management of tourist destinations.

The main objective of this study is to identify how environmental education plays a role in shaping ecological awareness and sustainable behavior among tourism actors, local communities, and tourists. This research also aims to analyze strategies and challenges in the integration of environmental values into policies, curricula, and educational practices in the tourism sector, both through formal education and non-formal and community-based approaches.

The data sources in this study consist of secondary literature which includes scientific journal articles, academic books, research reports, policy documents, and technical guidelines from relevant national and international institutions, such as UNESCO, UNWTO, the Ministry of Tourism and Creative Economy, and the Ministry of Environment and Forestry. The literature was collected through systematic searches in various scientific databases such as Google Scholar, Scopus, JSTOR, DOAJ, and Perpustakaan Indonesia using keywords such as: "environmental education", "sustainable tourism", "ecotourism and community participation", "environmental education for tourism", "green tourism behavior", and "sustainable tourism development".

The selection criteria include publications in the last eight years (2017–2025), in Indonesian and English, and are thematically relevant to the issue of education and sustainable tourism. Literature that is technical-descriptive without the depth of theoretical analysis and that does not have a direct connection to the context of education or tourism are excluded from the review.

The data analysis process was carried out thematically and interpretively, by identifying and grouping the main themes that appear repeatedly in the literature, such as: the integration of environmental education in the tourism sector, changes in tourist behavior through education, the role of local communities as educational agents, and the contribution of education to the conservation of natural resources of tourist destinations. The analysis is also directed at how education can function as an instrument of social transformation in building tourism practices that are more ethical, inclusive, and oriented towards long-term sustainability.

Through a systematic synthesis of literature based on an interdisciplinary theoretical framework, this research is expected to produce an in-depth conceptual understanding of the strategic contribution of environmental education in supporting the development of sustainable and responsible tourism in Indonesia.

RESULT AND DISCUSSIONS

The Strategic Role of Environmental Education in the Tourism Sector

Environmental education plays an important role in shaping ecological awareness among tourism actors, both tourists, industry players, and local communities. By providing a normative foundation, this education serves not only as an instrument of behavior transformation, but also as a vehicle for promoting sustainable tourism practices. Through planned and integrated education, individuals can understand the impact of tourism activities on the environment and society, as well as how they can contribute to reducing those negative impacts. For example, environmental education programs based on hands-on experience in conservation areas can foster a sense of empathy and responsibility for the environment. (Juniasa, 2020) (Citra & Pitana, 2023) (Rusmaniah et al., 2023)

A practical example of the implementation of environmental education in the context of tourism is an environmental interpretation program held in a national park or conservation area. The program is designed to provide visitors with knowledge about biodiversity, ecosystems, and the importance of environmental conservation. In this context, education is not only informative, but also invites tourists to be actively involved in protecting the environment through activities carried out at tourist sites. This also encourages collaboration between destination managers and local communities, which in turn strengthens community-based tourism and creates positive social and economic impacts. (Widari, 2022) (Bahij et al., 2022) (Personal Faith et al., 2021)

Community-based ecotourism training is also one of the effective methods in presenting environmental education in tourism. Through this training, local communities are not only trained on how to manage sustainable tourism, but are also equipped with the skills to protect and care for their environment. This activity can be in the form of an understanding of waste management, wise use of natural resources, to environmentally friendly local product marketing techniques. Thus, local communities are expected to obtain economic benefits while contributing to environmental preservation. (Ichsan et al., 2024) (Darmawan et al., 2023) (Purnami, 2021; Sabardila et al., 2020)

However, challenges remain in implementing environmental education in the tourism sector. Not all tourism industry players have a sufficient understanding of the importance of sustainable practices, and this can be used as an inhibiting factor in the implementation of educational programs. In addition, the lack of support from the government and related institutions can also affect the continuity of existing environmental education programs. (Citra & Pitana, 2023) (Samosir & Boiliu, 2022)

Through a holistic approach, the strategic role of environmental education in the tourism sector can contribute not only in addressing environmental issues, but also in creating collective awareness among all stakeholders. Good education will encourage individuals to act responsibly towards their environment, so that any tourism activity can be carried out in a way that takes sustainability and conservation into account. (Heryanti et al., 2018) (Nugroho, 2022)

In addition, environmental education must also ensure long-term sustainability by always evaluating and improving existing programs. This includes making adjustments to local contexts that may differ from one region to another. Adopting a participatory approach to the development of environmental education programs can result in a deeper impact, where the community is involved in curriculum development and delivery of educational materials. Thus, environmental education in the tourism sector is not only a burden, but also a valuable asset for the development of a region and the sustainability of responsible tourism. (Personal Faith et al., 2021) (Rusmaniah et al., 2023)

Integration of Environmental Education in Tourism Policy and Curriculum

The integration of environmental education (PLH) in national and local policies in the tourism sector is an important step towards achieving sustainable development goals. In Indonesia, tourism policies often still focus on economic aspects and do not fully consider ecological factors and environmental conservation. For example, although there are several policies that encourage sustainable tourism development, the implementation of environmental

education principles in these policies can still be said to be minimal. This shows that there is an urgent need to formulate policies that are more oriented towards environmental conservation as well as strengthening environmental awareness among tourism actors, including tourists and local communities. (Putri et al., 2023) (Aswita et al., 2023) (Eslami et al., 2018; Giampiccoli et al., 2020)

The current tourism education curriculum also needs to contain more ecological and conservation aspects. Formal education in tourism institutions should include material that focuses not only on tourism management, but also on the importance of environmental conservation. By integrating components such as ecological principles and tourism ethics into the curriculum, students will be better prepared to face challenges related to sustainability in this sector (Sangpikul, 2019). This will further encourage graduates to implement more responsible practices in tourism management, thereby generating a positive impact on the environment. (Guo et al., 2019) (Kurniawan, 2024)

However, the challenges in integrating environmental education into formal and informal education are great. Obstacles such as lack of awareness on the part of education managers, limited resources, and resistance to change have become obstacles to the systematic implementation of PLH. In addition, the lack of political support and funding from the government for environmental education programs is also a factor that hinders progress. Therefore, it is important to involve various stakeholders in formulating policies that support the integration of environmental education in the tourism sector. (Guo et al., 2019; Nga et al., 2018) (Putri et al., 2023)

Training for tourism industry players, from destination managers to tour guides, is one of the effective ways to implement environmental education. Through this training, they not only gain knowledge about sustainable practices, but can also play an active role in disseminating such information to tourists. Programs such as environmental interpretation in conservation areas can be concrete examples of how education can be applied in real practice on the ground, and educate visitors about the importance of conservation. (Burgoyne & Mearns, 2020) (Gong et al., 2019)

At the community level, initiatives involving local citizens in environmental education can also make a significant impact. Community-based programs that involve communities in natural resource management will build a sense of ownership and responsibility for the environment. By creating synergy between formal and informal education, the community will better understand the importance of preserving the environment, thereby encouraging pro-environmental attitudes in daily tourism activities. (Andi & Yi, 2025) (Mufidah & Hadiani, 2025)

Through this comprehensive and synergistic strategy, the integration of environmental education in the tourism sector in Indonesia is expected to not only contribute to the conservation of natural resources but also form a new generation of tourism actors who are more aware of the environmental impact of their activities. The success of this integration will depend on the support of all parties, including governments, educational institutions, and communities, to jointly create responsible and sustainable tourism. (Gidebo, 2019) (Gidebo, 2019)

The Impact of Environmental Education on Changing Behavior of Tourists and Industry Players

Environmental education has a significant impact on changing the behavior of tourists and industry players after they participate in educational programs. Many studies show that after attending an environmental education program, tourists tend to show a higher awareness of sustainability practices, such as waste reduction and the need to preserve biodiversity. Programs that educate about the impact of tourism on ecosystems and ways to reduce them can increase tourists' positive behavior in their interactions with the surrounding environment. Education not only educates, but also inspires individuals to commit to more responsible practices, both while traveling and in daily life. (Ozbey et al., 2024; Sayuti, 2023)

The role of tour operators and local communities is crucial in conveying sustainability messages. Tour operators that apply sustainability principles in their tour packages can shape tourist behavior through programs that emphasize the need to take care of local nature and culture. Local communities, with active involvement in providing environmental education, can amplify this message and create a more supportive environment for sustainable tourism practices. (Ostapchuk et al., 2024; Sayuti, 2023)

One successful example of an educational approach can be seen in the Bali Green School program, which teaches sustainability principles to students and the surrounding community. By integrating environmental education in their curriculum, the school has encouraged a new generation to become caring and responsible environmental ambassadors. The program not only impacts students, but also extends its influence to parents and the wider community, allowing for the instillation of sustainability values in everyday life. (Sayuti, 2023)

Similarly, Nglanggeran Tourism Village in Yogyakarta has successfully implemented an educational approach to promote sustainability. In these communities, environmental education becomes an integral part of the tour packages offered, which not only increases environmental awareness but also encourages local actors to be directly involved in sustainable tourism management.

Komodo National Park also displays success when implementing environmental education to maintain the unique ecosystem of the Komodo dragon islands. Educational programs targeting tourists and local communities raise awareness of the importance of conservation of endangered species and their habitats. Local communities are trained to manage resources responsibly, which helps spread the message of conservation not only to visitors, but also within the wider community. (Font et al., 2023)

One of the challenges faced in the application of environmental education in tourism is the resistance from industry players who are still tied to traditional practices that are not sustainable. Short-term economic motivation often trumps efforts to switch to more environmentally friendly practices. With stronger incentives from the government and educational institutions, these challenges can be overcome so that educational programs can be integrated more effectively in the management of tourist destinations. (Han, 2021; Huda et al., 2024)

Collaboration among all stakeholders—including government, education, the tourism industry, and local communities—is essential to optimize the impact of environmental education on changing tourist attitudes and practices. Only with a multidisciplinary approach can we build a tourism ecosystem that is not only profit-oriented, but also considers and respects the environment and local culture. (Buhalis et al., 2023; Pratama et al., 2024)

In order to achieve sustainability in tourism, environmental education must be integrated as a key strategy. By providing knowledge and skills to tourists and local communities, we are not only building awareness, but also ensuring that the future of the tourism industry becomes more sustainable and environmentally friendly. (Buhalis et al., 2023; Maulana et al., 2021)

Obstacles and Challenges to the Implementation of Environmental Education in Tourist Destinations

The implementation of environmental education in tourist destinations is faced with various significant obstacles and challenges. One of the main challenges is the limitation of human resources and adequate funding. Without adequate training for tourism industry players, sustainability practices are difficult to implement effectively. Many destination managers do not have sufficient knowledge of the basic principles of environmental education, resulting in a lack of accurate information and improvement efforts. Every environmental education program requires investment, both in the form of funds and time, and one of the major obstacles is the lack of financial support from the government or private institutions. (Labobar & Kapojos, 2023)

In addition, the lack of awareness and interest of tourism actors in the sustainability aspect is another problem. Although some data shows that tourists are becoming more aware of environmental issues, tourism industry players often do not show the same commitment. Many are more focused on short-term economic potential than considering the long-term impact of their activities on the surrounding environment, creating a mismatch between the needs of environmental education and the needs of industry. (Ismail, 2020)

Inequality of access to information between the central and regional governments is a challenge that is often overlooked. Areas with limited access to information related to sustainability practices often lag behind in the effective implementation of environmental education. Gaps in the distribution of knowledge and resources between large cities and remote areas have the potential to widen the gap of economic and environmental injustice within a country, coupled with the lack of infrastructure to support environmental education programs in the region. (Rodiana, 2023)

Resistance to changes in consumptive behavior among tourism actors and tourists can exacerbate existing problems. Many tourists still have a mindset that encourages excessive consumptive behavior, contributing to problems such as pollution and exploitation of natural resources. Although environmental education has been shown to be capable of changing behavior, this process takes time and a systematic approach. Therefore, it is important to take a more holistic approach, combining education with initiatives that facilitate broader social and cultural change. (Rasyid & Muzaki, 2019)

Studies conducted by Labobar and Kapojos show that ecological literacy plays an important role in shaping people's attitudes and behaviors towards the environment. These findings highlight the importance of integrating environmental education into tourism policy, where tourism industry players can be equipped with information and skills to effectively convey sustainability messages. When tour operators recognize the importance of environmental education, they can play a more active role in educating tourists and empowering local communities. (Labobar & Kapojos, 2023)

The experiences of several regions, such as Komodo National Park and Nglanggeran Tourism Village, show how education-based programs can increase awareness and involvement of all relevant parties in sustainability efforts. However, to duplicate these successes elsewhere, adjustments need to be made to the local context, especially in terms of local resources and culture. (Sirih et al., 2024)

Although the challenges in the implementation of environmental education in tourist destinations are obvious, a sustainable and collaborative approach is still possible. Strengthening cooperation between governments, non-governmental organizations, local communities, and the private sector can bring innovative and evidence-based solutions to address these barriers. With the right investment and shared commitment, environmental education can be an effective tool to drive real change in the tourism industry. (Pratiwi & Sukmono, 2018)

The Contribution of Environmental Education to the Social and Ecological Sustainability of Destinations

Environmental education (PLH) has a very important role in supporting social and ecological sustainability in tourist destinations. Through education, the strengthening of local identity and cultural preservation is becoming increasingly realized, along with increasing public awareness of the importance of protecting their environment and cultural heritage. This provides an opportunity for local communities to synergize with the tourism industry, where they can play an active role in supporting the sustainable development of tourism while preserving and celebrating local traditions, values, and culture. (Pratama et al., 2024)

Knowledge about PLH is crucial in supporting the conservation of natural resources in tourist areas. Integrated environmental education programs can help tourists and local communities understand the importance of protecting ecosystems and natural resources, as well as provide concrete solutions to mitigate the negative impacts faced by the tourism industry. For example, tourism agencies that implement environmental education programs in locations such as beaches and national parks can educate visitors on ways to maintain the beauty and health of the natural environment, while strengthening their commitment to sustainability. (Daeli & Satato, 2024)

The success of environmental education in supporting sustainability can also be seen from the achievement of sustainable tourism goals. With aligned goals such as ecological integrity, social justice, and economic feasibility, PLH helps all stakeholders to understand their responsibilities in maintaining balance. Through educational programs that prioritize environmentally friendly practices, many tourist attractions have reported success in managing their resources efficiently and sustainably. (Q. Chen & Wang, 2024)

One real example of this success can be seen in at least two environmental education programs that took place in Bali and Yogyakarta. In Bali, schools such as Bali Green School introduced a curriculum that specifically addresses environmental and sustainability issues, so that the younger generation can develop a strong understanding of the need to protect the environment. Meanwhile, the Nglanggeran Tourism Village program focuses on the conservation of natural resources and local culture, which in turn leads tourists to better appreciate and preserve the place. (Jannah et al., 2024)

Furthermore, environmental education as a tool to engage local communities in sustainable tourism management is also exemplary. Communities actively involved in these programs can bring about significant changes in the tourism practices and policies they undertake, creating a multiplier effect on sustainability awareness. Community participation in the formulation of tourism planning policies not only benefits entrepreneurs in business, but also ensures that the rights and interests of local communities are maintained. (Ramchurjee & Ramchurjee, 2019)

However, challenges remain. Limited resources and interest in the implementation of environmental education can result in a lack of maximum results. Responding to changes in attitudes and behaviors among tourists and industry players often takes longer, presenting challenges in achieving them. By integrating proper training and motivating all stakeholders to live out sustainability principles, these goals can be more easily achieved. (Machado Toffolo et al., 2022)

Overall, environmental education is not just an addition to the tourism agenda, but an important factor in achieving social and ecological sustainability in tourist destinations. Efforts in environmental education not only educate individuals about the importance of taking care of the environment, but also help build a more resilient and empowered society. As a result, this creates a positive atmosphere for the development of a sustainable tourism industry that provides balanced economic, social, and environmental benefits. (Choi, 2024)

CONCLUSION

This research shows that environmental education has a strategic role in building more sustainable and responsible tourism practices in Indonesia. Through a systematic literature approach, this study found that environmental education not only shapes ecological awareness among tourists, industry players, and local communities, but also encourages behavioral transformation towards more ethical and environmentally conservative tourism practices. The integration of sustainability values in education curriculum and tourism policy still faces a range of challenges, including limited resources, cultural resistance, and lack of institutional support. However, various case studies such as Bali Green School and Nglanggeran Tourism Village show that a holistic and participatory educational approach is able to create a positive impact socially, ecologically, and economically. Effective environmental education also contributes to the preservation of local culture, conservation of natural resources, and strengthens social cohesion in tourist destinations. Therefore, synergy between educational institutions, the government, the community, and industry players needs to be strengthened so that environmental education is truly the main foundation in realizing inclusive, responsible, and sustainable tourism.

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