Jurnal Ilmiah Peuradeun
The Indonesian Journal of the Social Sciences
Journal Homepage:
https://journal.scadindependent.org/index.php/jipeuradeun

Vol. 14, No. 2, May 2026	Copyright © 2026, is licensed under a CC-BY-SA
Pages: 797-820	Publisher: SCAD Independent
DOI: https://doi.org/10.26811/peuradeun.v14i2.2561	P-ISSN: 2338-8617 / E-ISSN: 2443-2067

Developing an Ethno-Ecotourism Environmental Education Model for Sustainable Coastal Tourism in Aceh Indonesia

Dian Aswita[1]; Nafisah Hanim[2]; Cut Ratna Dewi[3]; Nur Aisyah Ainun[4]; Firdaus Daud[5]; Syamsul Rizal[6]
[1,4,5]*Universitas Negeri Makassar, Indonesia*
[2,3]*Universitas Islam Negeri Ar-Raniry Banda Aceh, Indonesia*
[6]*Universitas Serambi Mekkah, Banda Aceh, Indonesia*
[1]*Correspondence Email: dian.aswita@unm.ac.id*

Article Info

Received: August 8, 2025
Accepted: May 22, 2026
Published: May 30, 2026
Online First: May 30, 2026

Keywords

Environmental Education;
Indigenous Knowledge;
Sustainable Tourism;
Ethno-Ecotourism;
Four-D Model.

Abstract

Tourism expansion in environmentally sensitive coastal areas continues to intensify ecological pressures, while conventional environmental education often remains disconnected from indigenous socio-cultural realities. Although customary institutions have long contributed to environmental stewardship, limited research has transformed indigenous governance into a structured educational framework for sustainable tourism. This study aimed to develop and validate an Ethno-ecotourism-based Environmental Education Model that operationalizes Acehnese customary institutions as pedagogical mechanisms for sustainability education. Using a Research and Development (R&D) approach through the Four-D framework and a sequential explanatory mixed-method design, data were collected through interviews and observations involving 15 key informants, expert validation by seven specialists, and practicality testing with 30 tourism practitioners. Qualitative data were analyzed using the interactive model of Huberman and Saldaña, while quantitative data were examined using descriptive statistics. The findings indicated that the model was both valid and practical, with the social system emerging as its strongest component. The study demonstrated that indigenous governance could serve as an educational infrastructure that strengthened environmental responsibility, community-based conservation, and sustainable tourism. By integrating customary law into a validated pedagogical framework, this research contributes to the theory of environmental education and provides a culturally responsive pathway to sustainability in indigenous and coastal communities.

A. Introduction

Tourism has become one of the most influential drivers of economic growth worldwide, creating employment opportunities and stimulating regional development (Efthimiou, 2025; Khan et al., 2020; Pirson et al., 2019). Yet behind these benefits lies a persistent paradox. The expansion of tourism continues to place increasing pressure on ecosystems, accelerating environmental degradation in many destinations despite the widespread adoption of sustainability agendas (Caparrós-Martínez et al., 2022; Deets et al., 2020; Kataya, 2020). This contradiction suggests that sustainability challenges in tourism are not merely regulatory or technical problems but also educational ones. Environmental degradation often persists because tourism stakeholders lack environmental awareness that is meaningful within their own socio-cultural realities (Emayomi & Mkpado, 2025; Tandon et al., 2023; Xie et al., 2024). Consequently, the gap between global sustainability aspirations and local environmental practices remains substantial.

Environmental education (EE) has long been promoted as a strategic solution for cultivating responsible environmental behavior. However, dominant EE frameworks remain largely grounded in Western educational traditions that prioritize scientific literacy and individual cognitive awareness (Bai, 2020; Edwards, 2020; Suraijiah et al., 2026). While these approaches have proven valuable in formal and urbanized settings, their effectiveness becomes less certain when applied to indigenous and customary law-based societies. A growing body of scholarship argues that environmental learning cannot be separated from local cultural systems, social norms, and indigenous knowledge structures that shape environmental behavior (Asefa, 2017; Cholil & Parker, 2021; Parker, 2017; Zeyer & Kelsey, 2013).

Recent studies have expanded this critique by highlighting a deeper ontological tension between dominant environmental education paradigms and indigenous ecological worldviews. Conventional approaches often treat humans and nature as separate entities, whereas many indigenous communities understand ecological relationships through interconnected spiritual, cultural, and moral obligations (Álvarez & Coolsaet, 2020; Mbah et al., 2021; Mbah & Ezegwu, 2024; Shabalala, 2025). This suggests that the limited effectiveness of environmental education in many developing regions may stem not only from implementation failures but also from the inability of existing frameworks to resonate with local ways of understanding and governing nature.

The relevance of this debate is evident in Aceh, Indonesia, where environmental governance is strongly influenced by customary institutions such as *Hukom Adat Laôt* and *Hukom Adat Uten*. Environmental behavior is often regulated through socio-cultural sanctions, collective norms, and spiritual values rather than formal ecological regulations alone

(Mulya & Salvi, 2024). These customary systems have long contributed to environmental conservation through community-based management practices rooted in local wisdom (Mahlil et al., 2021; Rangkuti et al., 2020; Safrina, 2015). However, existing studies largely position these institutions as objects of cultural or ethnographic inquiry rather than as operational educational mechanisms capable of systematically guiding tourism stakeholders.

At the same time, global conservation scholarship increasingly recognizes indigenous knowledge as a sophisticated adaptive system that contributes to climate resilience and sustainable resource management (Abas et al., 2022; Aguinis et al., 2023; Fei et al., 2023; Harrahap & Santiago, 2024; Simarmata & Indrawati, 2022). Evidence from various regions demonstrates that conservation initiatives are more effective when aligned with indigenous governance structures (Burbano et al., 2022). Similarly, studies in Indonesia have highlighted efforts to integrate environmental education into tourism through community engagement and ecological innovation (Akib, 2024; Hidayati et al., 2022; Nofriya & Fadhly, 2020; Rambe et al., 2022; Satria & Aldi, 2023). Nevertheless, a significant gap remains. Existing studies have primarily documented local wisdom and environmental values but have provided limited guidance on how indigenous socio-legal institutions can be systematically transformed into validated environmental education models for tourism governance.

This study addresses that gap by introducing the concept of Ethno-ecotourism Education. Unlike previous approaches that treat local wisdom primarily as educational content, this study positions customary socio-legal institutions as the core pedagogical mechanism through which environmental learning is delivered and sustained. The novelty of this research lies in the systematic integration of indigenous governance structures into a validated environmental education framework developed through the Four-D Research and Development model. Through this approach, abstract sustainability principles are translated into culturally meaningful and socially enforceable learning practices.

Therefore, this study aims to develop and validate an Ethno-ecotourism based Environmental Education Model that operationalizes Aceh's customary legal institutions into a structured pedagogical framework for tourism stakeholders. By bridging indigenous governance and contemporary sustainability education, this research seeks to contribute to the advancement of environmental education theory while providing a practical model for community-based sustainable tourism governance.

B. Method

This study employed a Research and Development (R&D) approach using the Four-D framework—Define, Design, Develop, and Disseminate—as proposed by Thiagarajan

(Firdausi et al., 2023; Rachman et al., 2024). The study adopted a sequential explanatory mixed methods design to systematically develop and validate an Ethno-ecotourism based Environmental Education Model. The qualitative phase was conducted to identify indigenous ecological values and customary governance practices relevant to sustainable tourism, while the quantitative phase was used to evaluate the validity and practicality of the developed model.

The research was conducted in the Coastal Strategic Development Area of Aceh Province, Indonesia, where *Hukom Adat Laôt* functions as a prominent customary institution regulating community interactions with coastal resources. The development process followed four consecutive stages of the Four-D framework.

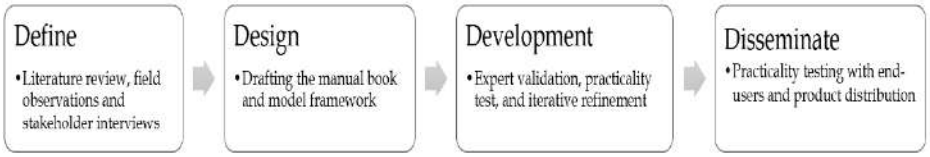

Figure 1. Research Procedure with Four-D Framework

Participants were selected through purposive sampling to ensure the relevance and richness of information required for model development. The qualitative phase involved 15 key informants consisting of customary leaders and tourism practitioners who possess direct knowledge of local environmental governance. The validation stage involved seven experts, including three environmental education specialists, two ecotourism practitioners, and two curriculum experts, each with at least ten years of professional experience. The practicality test was conducted with 30 tourism practitioners actively involved in coastal tourism management in Aceh.

Data were collected through semi-structured interviews, field observations, expert validation sheets, and practicality questionnaires. Interviews and observations were used to identify indigenous ecological values embedded within Acehnese customary institutions. The quantitative instruments employed a five-point Likert scale to assess the instructional manual and model framework, including content, learning activities, presentation, readability, supporting theory, syntax, social system, reaction principles, support system, and instructional and nurturant effects. Practicality questionnaires were administered to evaluate the feasibility of implementing the developed model in real tourism contexts.

Qualitative data obtained from interviews and observations were analyzed using the interactive model of Huberman and Saldaña, consisting of data condensation, data display, and conclusion drawing and verification (Miles et al., 2014). Credibility was

strengthened through member checking and audit trail procedures. Quantitative data derived from expert validation and practicality assessments were analyzed using descriptive statistics. Model feasibility was determined using Criterion-Referenced Evaluation criteria on a five-point scale as proposed by Mardapi (2012), while practicality levels were assessed using the criteria developed by Sari et al. (2019).

Table 1. Conversion of actual scores for validity

Aspect	Score Range	Criteria	Aspect	Score Range	Criteria
For Instructional Manual			**For Model**		
Materail/ content (18 items)	$\dot{X} > 75,6$	Very Good	Supporting theory, Syntax, Social system, Reaction principle, Instructional & Nurturant Effects (each consisting of 2 items)	$\dot{X} > 8,4$	Very Good
	$61,2 < \dot{X} \leq 75,6$	Good		$6,8 < \dot{X} \leq 8,4$	Good
	$46,8 < \dot{X} \leq 61,2$	Fair		$5,2 < \dot{X} \leq 6,8$	Fair
	$32,4 < \dot{X} \leq 46,8$	Poor		$3,6 < \dot{X} \leq 5,2$	Poor
	$\dot{X} \leq 32,4$	Very Poor		$\dot{X} \leq 3,6$	Very Poor
Learning activities (7 items)	$\dot{X} > 29,4$	Very Good	Support system (3 items)	$\dot{X} > 12,6$	Very Good
	$23,8 < \dot{X} \leq 29,4$	Good		$10,2 < \dot{X} \leq 12,6$	Good
	$18,2 < \dot{X} \leq 23,8$	Fair		$7,8 < \dot{X} \leq 10,2$	Fair
	$12,6 < \dot{X} \leq 18,2$	Poor		$5,4 < \dot{X} \leq 7,8$	Poor
	$\dot{X} \leq 12,6$	Very Poor		$\dot{X} \leq 5,4$	Very Poor
Presentation (20 items)	$\dot{X} > 84$	Very Good			
	$68 < \dot{X} \leq 84$	Good			
	$52 < \dot{X} \leq 68$	Fair			
	$36 < \dot{X} \leq 52$	Poor			
	$\dot{X} \leq 36$	Very Poor			
Legibility (8 items)	$\dot{X} > 33,6$	Very Good			
	$27,2 < \dot{X} \leq 33,6$	Good			
	$20,8 < \dot{X} \leq 27,2$	Fair			
	$14,4 < \dot{X} \leq 20,8$	Poor			
	$\dot{X} \leq 14,4$	Very Poor			

Table 2. Conversion of actual scores for practicality

Percentage of Implementation	Criteria	Description
90-100%	Very Practical	No Revisions Needed
75-90%	Practical	Minor Revisions
65-75%	Quite Practical	Sufficient Revisions
55-65%	Less Practical	Many Things to Revise
< 55%	Very Less Practical	Repeated product creation

Ethical considerations were integrated throughout the research process. Prior to data collection, all participants were informed about the purpose of the study, the voluntary nature of their involvement, and their right to withdraw at any stage without consequence. Informed consent was obtained from all informants, experts, and tourism practitioners participating in the study. To protect participants' privacy, all data were anonymized and used exclusively for research purposes. The research was conducted with permission from relevant local authorities and community leaders, ensuring respect for local customs, cultural values, and indigenous knowledge systems throughout the model development process.

C. Results and Discussion

This section presents key findings regarding the development and testing of the Ethno-ecotourism based Environmental Education Model, a systematic framework designed to operationalize Acehnese customary law into a validated pedagogical instrument for improving stakeholders' sustainability outcomes.

1. Results

a. Define

The preliminary study was conducted through a combination of literature reviews and field observations in three key tourism development areas in Aceh: Sabang City, Aceh Jaya Regency, West Aceh Regency. The field study identified specific local wisdom components that serve as the foundation for the environmental education model. Data were gathered through in-depth interviews with coastal community leaders. The primary findings are summarized in the table below:

Table 3. Identification of local wisdom and ecotourism potential

Category of Customary Law	Local Wisdom Component	Spesific Rules & Traditional Regulations	Ecological & Social Values (Sustainability Impact)
Hukom Adat Laôt	*Khanduri Laôt*	Annual 3-day ritual. Includes *Duek Pakat* (consensus-building involving both men and women) and social charity for orphans.	Social: Strengthens social cohesion and community solidarity among coastal stakeholders.
	Pantang Melaôt	Mandatory fishing bans on: Fridays, Eid al-Fitr (2 days), Eid al-Adha (3 days), Independence Day (Aug 17), and Tsunami Commemoration (Dec 26).	Ecological: Provides a "rest period" for marine ecosystems, allowing natural regeneration of fish stocks.
	Adat Sosial	Mandatory assistance for vessels in	Humanitarian: Ensures safety

Category of Customary Law	Local Wisdom Component	Spesific Rules & Traditional Regulations	Ecological & Social Values (Sustainability Impact)
	(Social customs)	distress (SOS), rescue obligations for drowning victims, and returning drifted goods to the *Panglima Laôt.*	at sea and maintains harmonious relationships among tourism and fishing actors.
	Marine Environmental Protection	Ban on catching protected species (dolphins, turtles), prohibition of explosives/ poison/ electro-fishing, and ban on cutting coastal trees (mangroves, cypress)	Conservation: Protects biodiversity and prevents coastal erosion through natural buffer preservation.
Hukom Adat Uten/ Gle	*Adat & Larangan Gle* (Forest Prohibitions)	Regulations on forest management (*meugle*). Prohibition of cutting "bee trees" (*Tualang, Banyan*) and specific seasonal cutting bans	Preservation: Protects watershed trees and maintains vital habitats for pollinating fauna (bees).
	Wase Gle (Forest Royalties)	A traditional levy system where 10% of collected forest products (honey, rattan, resin) is contributed to the community	Green Economy: Promotes sustainable resource extraction and equitable wealth distribution.
	Conflict Resolution	Disputes regarding forest violateons are settled through *Duek Pakat* (deliberation) under the authority of the *Pawang Uten*	Governance: Reduces social friction through peaceful, consensus-based mediation rather than litigation.

The findings in Table 3 are expanded to show the transformation of qualitative findings into structural components of the model. The mapping is presented as follows.

Table 4. Mapping of local wisdom values into ethno-ecotourism based environmental education model components

Ecological & Social Values	Transformation into Model Component	Rationalization for Model Construction
Social: Strengthens social cohesion and community solidarity	Social System	The interaction pattern in this model is designed in the form of group learning, not individual learning.
Ecological: Provides a "rest period" for marine ecosystems	Learning Syntax (Phase 1: Idea Acquisition)	The initial stage where Learners do not only memorize theory, but capture and understand basic concepts.
Humanitarian: Ensures safety at sea and harmonious relationships	Nurturant Effects	The expected impacts that are formed indirectly during the continuous learning process are moral integrity, social concern, and empathy.
	Learning Syntax (Phase 3: Self-confidence for Growth)	This phase is where theory turns into action. Learners practice being leaders in the field, capable of solving problems and maintaining safety using customary legal authority.

Ecological & Social Values	Transformation into Model Component	Rationalization for Model Construction
Conservation: Protects biodiversity and prevents coastal erosion	Supporting Theory	In this case, conservation is no longer a top-down instruction but rather a construction of knowledge. This is relevant to social cognitive theory and constructivist theory. Social cognitive theory explains how they dare to act, while constructivist theory explains how they understand the meaning behind those actions.
	Learning Syntax (Phase 2: Idea Development)	Learners expand their initial ideas by integrating traditional prohibitions (e.g., ban on catching protected species) with modern ecological concepts to develop sustainable tourism programs
Preservation: Protects watershed trees and vital habitats	Instructional Effects (Knowledge & Skill)	Specifically targeted as a measurable competency: the ability of Learners to identify and protect vital flora
	Learning Syntax (Phase 2: Idea Development)	Learners expand their initial ideas by integrating traditional prohibitions (e.g., ban on cutting trees) with modern ecological concepts to develop sustainable tourism programs
Green Economy: Promotes sustainable resource extraction	Learning Syntax (Phase 4: Quality of Life)	This is the final stage of the learning process. In this phase, learners are invited to see the end results of all conservation efforts on their standard of living.
Governance: Reduces social friction through consensus	Reaction Principles	The Reaction Principle is a guide for instructors/ teachers on how they should respond to learners behavior. Instructors do not act as police who merely punish, but rather as facilitators who use persuasive methods (mutual agreement).
	Learning Syntax (Phase 3: Self-confidence for Growth)	This phase is the internalization phase of the role. Learners practice becoming impactful, custom-based mediators through mastery of local wisdom. Learners solidify their position as legitimate guardians of values in maintaining order at tourist destinations.

Based on the above data, the environmental education model integrates empirical findings from key informants consisting of Panglima Laôt Jaboi and Iboih (Sabang City), members of the Krung Sabe Watershed Forum (Aceh Jaya Regency), and *Pawang Uten* figures (West Aceh Regency), into its structural parameters. As detailed in Tables 3 and 4, there is clear synchronization between Acehnese customary rules and modern sustainability

principles. This transition from qualitative norms to an 'Ethno-ecotourism' framework is operationalized through six domains: social system, syntax, supporting theory, reaction principle, support system, and nurturant & instructional effects, effectively codifying customary law into pedagogical components.

The main finding is that there is synchronization between Acehnese customary rules and modern sustainability principles (sustainable tourism), especially in the aspects of habitat protection and community-based resource management.

b. Design and development

The output of this stage is an ethno-ecotourism based environmental education model and its accompanying instructional manual. The model's syntax consists of a four-stage cycle: (1) Idea acquisition, (2) Idea development, (3) Self-confidence for growth, and (4) Enhanced quality of life (Figure 2).

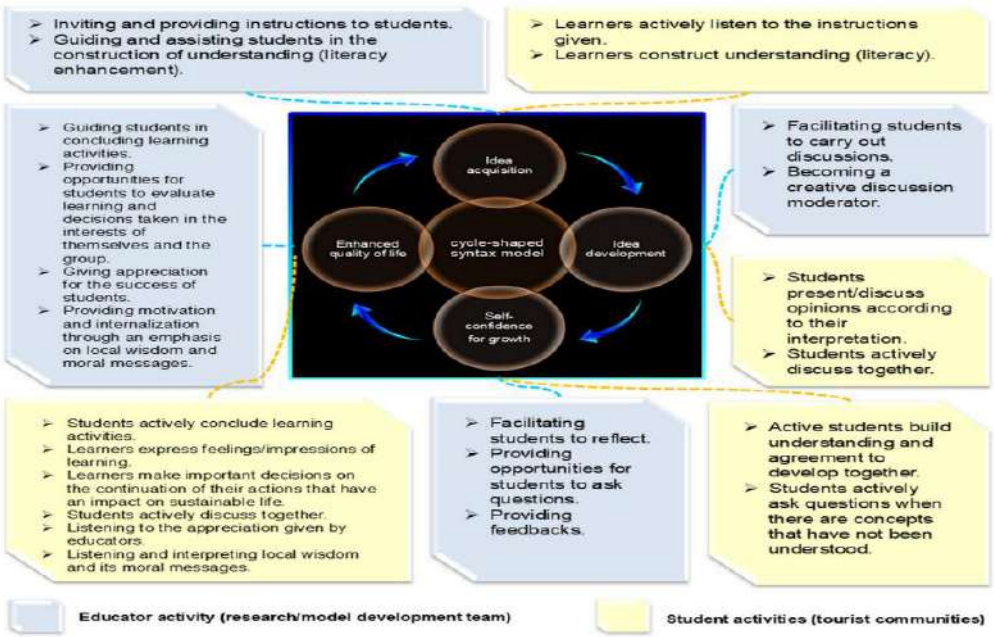

Figure 2. A cyclical syntax model in the learning process using an ethno-ecotourism based environmental education model

1) Expert validation results of instructional manual

To ensure the feasibility of the model, a desk evaluation was conducted by experts and stakeholders. The validation focused on four main aspects using a structured scoring rubric (Scale 1-5). The quantitative results are presented in Table 5.

Table 5. Validation of instructional manual

Aspect	Expert assessment							Average	Criteria
	1	2	3	4	5	6	7		
Material/content	82	76	80	81	78	78	80	79.28	Very Good
Learning activities	30	28	25	30	29	29	26	28.14	Good
Presentation	90	91	91	91	92	90	90	90.71	Very Good
Legibility	36	34	35	34	34	33	34	34.28	Good

The expert validation results for the instructional manual (Table 5) indicate that its material/content (Ẋ= 79.28) and presentation (Ẋ= 90.71) received a score of "Very Good," while the learning activities (Ẋ= 28.14) and legibility (Ẋ= 34.28) aspects only achieved a rating of "Good." These findings indicate a variance in assessments among expert assessments, objectively demonstrating the basic adequacy of the instructional manual's structure and content before field implementation.

2) Expert validation results of ethno-ecotourism based environmental education model

The model's effectiveness was further validated based on its social system, specifically the interaction patterns between educators and students. Based on the expert consensus reaching a high validity threshold, allowing the model to proceed to the implementation phase.

Table 6. Validation of model

Aspect	Expert assessment							Average	Criteria
	1	2	3	4	5	6	7		
Supporting theory	8	8	8	8	8	8	8	8.00	Good
Syntax	8	8	6	7	7	8	7	7.29	Good
Social system	8	8	9	8	10	9	8	8.57	Very Good
Reaction principle	8	9	7	7	8	8	8	7.86	Good
Support system	9	10	10	11	13	13	11	11.00	Good
Instructional & Nurturant Effects	6	9	8	7	7	9	8	7.71	Good

The validation results for the Ethno-Ecotourism based Environmental Education Model (Table 6) show that the social system (Ẋ= 8.57) received a score of Very Good. Other dimensions, including supporting theory (Ẋ= 8.00), syntax (Ẋ= 7.29), reaction principles (Ẋ= 7.86), support systems (Ẋ= 11.00), and instructional & nurturant effects (Ẋ= 7.71), were consistently rated in the "Good" category. These quantitative figures establish that the final structural components of the model have been validated and can proceed to the practicality testing stage.

Following the training of tourism practitioners (as seen in Figure 3), the team evaluated competency using a performance checklist. The evaluation focused on three domains: knowledge, skill, and insight.

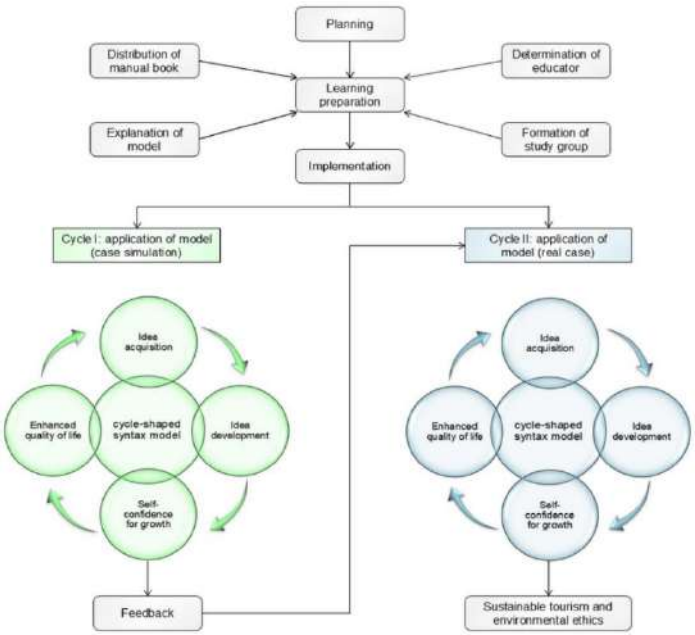

Figure 3. Prototype of the Ethno-Ecotourism based Environmental Education Model

The Terms and conditions for the implementation of the developed tourism model are as follows; (1) involved in providing nature tourism services, (2) participated in the distribution of an environmental education model based on the instructional manual of model (for the public sector and tourism service provider), and (3) Having a violation-free in the tourism area.

3) Practicality questionnaires results

Model of Ethno-ecotourism Based Environmental Education was developed based on observations and field tests of learning implementation. Practicality in this context refers to the implementation of the model's syntax and the use of the guidebook as a supporting tool. The results of the practicality test are presented as follows:

Table 7. Practicality questionnaires results of model

Aspect	Implementatio score per meeting:							Mean	Criteria
	I	II	III	IV	V	VI	VII		
Syntax	75	85	89	88	85	79	80	83	Practical
Social system	85	88	88	89	86	84	84	86,3	Practical

Aspect	Implementatio score per meeting:							Mean	Criteria
	I	II	III	IV	V	VI	VII		
Reaction principles	80	90	88	87	89	90	90	87,7	Practical
Support system	84	86	88	88	87	89	89	87,3	Practical
Total	**81**	**87,3**	**88,3**	**88**	**86,8**	**85,5**	**85,8**	**86,1**	**Practical**

The results of the practicality test confirm that the Ethno-Ecotourism Based Environmental Education Model consistently meets the "Practical" criteria in all aspects with an overall mean score of $\dot{X}$= 86.1. The data indicates that reaction principles achieved the highest average score ($\dot{X}$= 87.7), followed by support system ($\dot{X}$= 87.3) and social system ($\dot{X}$= 86.3). The syntax aspect, while consistently meeting the practical threshold, showed an average score of $\dot{X}$= 83.0 with numerical fluctuations observed between meeting I (75) and meeting III (89). The total implementation scores reached a peak in meeting III (88.3) and maintained stability in subsequent sessions. These quantitative trends confirm that the model's operational components have met the requirements for implementation within the tourism management context in Aceh.

c. Disseminate

The final stage of the 4D framework focuses on the strategic distribution of the validated model to ensure broader pedagogical and policy impacts. The dissemination activities are categorized into three primary channel.

1) Academic Dissemination: scientific findings are shared through presentations at international conferences, publication in monographs, and publication of articles in reputable journals.
2) Policy Integration: Findings are presented to government agencies through Focus Group Discussions (FGDs) to provide an evidence-based foundation for regional tourism development and environmental regulations.
3) Community Outreach: The validated instructional manual are distributed to tourism practitioners and local communities that maintain a violation-free status. These materials are provided as open-access resources to encourage active participation in sustainable nature tourism services.

A systematic evaluation using the Four-D model demonstrates that the Ethno-ecotourism based Environmental Education Model is not only scientifically valid but also culturally resonant and practically applicable. By integrating local wisdom into the learning model's components, this model provides a verifiable framework for promoting

sustainable tourism behavior within the specific socio-legal context of Aceh and its potential adaptation in similar customary environments.

2. Discussion

The most significant contribution of this study is not merely the achievement of satisfactory validity and practicality scores for the Ethno-ecotourism based Environmental Education Model, but its demonstration that indigenous governance systems can function as active pedagogical mechanisms for sustainability education. This finding challenges a long-standing assumption in environmental education that environmental literacy is primarily generated through scientific knowledge transfer and individual cognitive awareness. The strong validation and practicality results indicate that environmental learning becomes more meaningful when sustainability principles are embedded within socially recognized norms, cultural obligations, and community-based governance systems rather than being introduced solely through external environmental directives. In this regard, the study suggests that sustainability education is not simply a matter of providing ecological information but also of connecting environmental values with institutions that already possess social legitimacy within the community.

The variation between the high presentation score and the relatively lower legibility score offers an important insight into the relationship between cultural authenticity and educational accessibility. Although the instructional manual was perceived as visually attractive and pedagogically well-structured, the use of indigenous concepts such as *Hukom Adat Laôt* requires careful pedagogical translation to ensure accessibility for diverse tourism stakeholders. This finding reflects a broader challenge in environmental education initiatives. Educational interventions frequently fail not because communities reject sustainability values, but because environmental messages are communicated through conceptual frameworks that remain detached from local cognitive and cultural realities. As emphasized by Astawa (2025), Dolnicar and Demeter (2024), and Wang et al. (2024), environmental communication becomes effective only when ecological messages resonate with the lived experiences and practical knowledge of local communities. Therefore, the lower legibility score should not be interpreted as a limitation of indigenous knowledge itself but rather as evidence of the need to bridge local wisdom and formal educational discourse more effectively.

A more fundamental contribution emerges from the transformation of Acehnese customary institutions into a structured educational framework. The findings from the

Define stage indicate that institutions such as *Panglima Laôt* and *Pawang Uten* are not merely cultural symbols or historical remnants but continue to function as operational mechanisms of environmental governance. Existing environmental education frameworks typically position local wisdom as supplementary content intended to enrich educational materials. In contrast, this study argues that indigenous governance should be treated as the pedagogical architecture itself. Such a perspective shifts the role of local knowledge from passive cultural representation to an active mechanism capable of shaping environmental behavior. By integrating customary practices into the model's syntax, social system, reaction principles, and instructional outcomes, environmental education becomes anchored in social legitimacy rather than external enforcement.

This interpretation is supported by broader scholarship demonstrating that customary institutions continue to play significant regulatory roles within legally plural societies. Research in Aceh and other regions of Indonesia reveals that customary norms remain highly influential in shaping collective behavior because they operate through social legitimacy, cultural identity, and moral obligations rather than coercive legal sanctions alone (Ilyas et al., 2023; Ismail et al., 2023; Mawar & Iqbal, 2025). Similar patterns have been observed in various indigenous communities where customary and religious values coexist and jointly regulate social life (Shukri Nordin et al., 2025; Yanti et al., 2025). These studies collectively suggest that indigenous institutions possess adaptive capacities that extend beyond cultural preservation and can serve as effective governance mechanisms in contemporary society. The present study extends this discussion by demonstrating that such institutions can also function as educational infrastructures capable of cultivating environmental responsibility.

The findings further contribute to social cognitive and constructivist perspectives on learning. Conventional constructivist approaches emphasize the individual construction of knowledge through learning experiences (Huang & Lin, 2023). While this perspective remains important, the present study indicates that environmental responsibility in indigenous communities is rarely an individual endeavor. Rather, environmental behavior is shaped through collective norms, shared obligations, and culturally embedded systems of accountability.

Likewise, social cognitive theory highlights observational learning and social influence as drivers of behavioral change. This study broadens that perspective by showing that social influence within indigenous societies is mediated through culturally recognized

governance institutions. Consequently, environmental literacy appears to be more sustainable when supported by socially legitimate customary systems than when driven exclusively by externally designed environmental campaigns. This interpretation is consistent with arguments that educational effectiveness depends on balancing accessibility with cultural relevance (Baker & Lee, 2020; Karakanta, 2025).

The novelty of this research lies precisely in this theoretical repositioning. Previous studies have successfully documented the ecological values embedded within indigenous knowledge systems, yet most have treated customary law primarily as an object of ethnographic inquiry or cultural preservation. The present study moves beyond documentation by operationalizing customary law into measurable pedagogical components. Practices such as *Pantang Melaôt* and *Wase Gle* are not merely described as examples of local wisdom but are transformed into structured learning resources capable of shaping environmental behavior. This transformation is particularly important because contemporary scholarship increasingly recognizes that customary institutions are dynamic systems capable of adapting to modern social challenges while maintaining normative legitimacy within local communities (Shukri Nordin et al., 2025; Yanti et al., 2025; Aziz et al., 2024). Therefore, this study demonstrates that the persistent gap between environmental awareness and environmental action cannot be addressed solely through the provision of information. Behavioral change becomes more likely when sustainability principles are internalized through culturally meaningful practices that communities already recognize as legitimate and socially binding.

The practicality assessment further reinforces this argument. The consistently high implementation scores indicate that the model can function effectively within tourism management contexts without generating tension between environmental objectives and local cultural identities. This finding is particularly relevant because tourism development often imposes standardized sustainability frameworks that may inadvertently marginalize local values. The present study offers an alternative pathway in which sustainability is achieved through the revitalization of local governance systems rather than their replacement. Similar observations have been reported in studies emphasizing the importance of indigenous values for tourism sustainability (Ransfield & Reichenberger, 2021; Sarmento, 2020). However, the present study advances this discussion by demonstrating how such values can be systematically embedded within a validated educational model. The practical implication is that tourism stakeholders are more likely to adopt sustainability-oriented behavior when environmental education aligns with existing cultural identities

rather than introducing unfamiliar normative frameworks. This interpretation is supported by broader evidence indicating that cultural integration strengthens social cohesion, environmental awareness, and sustainable tourism outcomes (Coll-Ramis et al., 2024; Li et al., 2022; Sihombing et al., 2024; Tang & Xu, 2023).

Beyond the Acehnese context, the findings carry broader international significance. Contemporary sustainability debates increasingly acknowledge the limitations of development approaches that prioritize external scientific perspectives while marginalizing indigenous knowledge systems. The present study provides empirical support for this critique by demonstrating that customary governance can be systematically integrated into validated educational structures without sacrificing scientific rigor. The findings resonate with broader discussions on decolonizing environmental education and strengthening community-based approaches to sustainability (Luetz, 2024; Wantik et al., 2024). They further support evidence showing that environmental awareness is enhanced when educational interventions incorporate local ecological knowledge, cultural practices, and spiritual relationships with nature (Ginting et al., 2025; Jacoba, 2025; Sihombing et al., 2025). In this respect, the model contributes directly to global efforts associated with Sustainable Development Goal (SDG) 4 on Quality Education by promoting culturally responsive environmental learning, while simultaneously supporting SDG 13 on Climate Action through the development of environmentally responsible behavior and community-based ecological stewardship.

More importantly, the broader significance of this model extends beyond environmental education itself. Similar patterns of coexistence between customary norms, religious values, and formal governance structures have been documented across diverse societies, illustrating the adaptive capacity of legal and cultural pluralism in responding to contemporary social challenges (Ilyas et al., 2023; Ismail et al., 2023; Mawar & Iqbal, 2025; Shukri Nordin et al., 2025; Yanti et al., 2025). The present study demonstrates that such pluralistic governance arrangements can also become powerful educational resources for advancing sustainability agendas. Consequently, the integration of ethnic values and ecological stewardship should not be viewed merely as a local innovation but as a potentially transferable strategy for promoting climate resilience, environmental justice, and community-centered sustainable development across diverse cultural settings. Given the coastal orientation of *Hukom Adat Laôt* and its role in regulating resource use, the model also aligns with SDG 14 (Life Below Water) by encouraging sustainable

interactions with marine ecosystems through culturally grounded environmental governance. These findings suggest that indigenous governance systems can provide valuable pathways for achieving global sustainability targets while preserving cultural diversity and strengthening local institutional resilience.

Despite the significant pedagogical insights generated by this study, several limitations should be acknowledged. First, the relatively lower performance observed in the legibility dimension indicates the need for further simplification of instructional content without compromising the cultural integrity of indigenous concepts. Second, although the model demonstrated strong practicality during field implementation, its long-term sustainability beyond the research period has not yet been empirically established. Third, this study was developed and validated within the socio-cultural context of Aceh, where customary institutions continue to possess strong social legitimacy. Consequently, the findings should be interpreted within this contextual setting, and the transferability of the model to other indigenous communities requires further empirical examination.

D. Conclusion

This study developed and validated an Ethno-ecotourism based Environmental Education Model that operationalizes Acehnese customary institutions as pedagogical mechanisms for sustainability education in tourism contexts. The findings demonstrate that indigenous governance systems such as *Hukom Adat Laôt*, *Panglima Laôt*, and related customary practices are not merely cultural assets but can function as structured educational resources capable of fostering environmental responsibility and supporting sustainable tourism governance. By integrating indigenous ecological values into a validated educational framework, the study confirms that environmental learning becomes more effective when sustainability principles are embedded within culturally legitimate systems of social regulation and collective accountability.

The study contributes to environmental education by demonstrating that environmental literacy in indigenous communities is shaped not only by cognitive learning processes but also by customary institutions that regulate collective behavior. It extends social cognitive and constructivist perspectives by positioning indigenous governance as an educational infrastructure rather than merely a cultural context. Practically, the study offers a replicable framework for transforming customary law and local wisdom into measurable pedagogical components that support sustainability education, tourism management, and community-based conservation.

The significance of this research extends beyond the Acehnese context. The model provides a practical pathway for integrating indigenous knowledge, cultural heritage, and environmental stewardship within educational practice, thereby contributing to broader efforts toward sustainable tourism, climate resilience, environmental justice, and community-centered sustainability. The findings suggest that effective environmental governance depends not only on formal regulations but also on culturally legitimate institutions that communities recognize, trust, and actively sustain.

Building on the limitations identified in this study, future research should examine the long-term effectiveness of the model in shaping conservation behavior and sustaining environmental commitment beyond the initial implementation period. Further studies are also needed to evaluate the adaptability of the model across indigenous communities with different socio-cultural and governance traditions, thereby assessing its broader applicability and contextual flexibility. Comparative investigations involving customary systems in other regions may provide valuable insights into the conditions under which indigenous governance can be successfully transformed into educational instruments for sustainability.

This study confirms that customary institutions are not merely cultural heritage to be preserved but strategic resources for advancing environmental education and sustainable tourism. When local wisdom is systematically integrated into educational practice, sustainability becomes a shared social commitment rather than solely a regulatory obligation.

Acknowledgments

The authors would like to thank the Ministry of Higher Education, Science, and Technology of the Republic of Indonesia and also thanks to the expert, who provided the development, assessment, and validity of the model.

Declaration of Competing Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Declaration of Generative AI

The authors declare that artificial intelligence (AI) tools were used in a limited and responsible manner during the preparation of this manuscript, specifically to assist with language refinement, clarity of expression, and grammatical consistency. The authors take full responsibility for the content, accuracy, originality, and integrity of the manuscript.

Bibliography

Abas, A., Aziz, A., & Awang, A. (2022). A Systematic Review on the Local Wisdom of Indigenous People in Nature Conservation. *Sustainability (Switzerland)*, *14*(6), 1–16. https://doi.org/10.3390/su14063415

Aguinis, H., Kraus, S., Pocek, J., Meyer, N., & Jensen, S. H. (2023). The why, how, and what of public policy implications of tourism and hospitality research. *Tourism Management*, *97*(104720), 1–13. https://doi.org/10.1016/j.tourman.2023.104720

Akib, E. (2024). Pariwisata dalam Tinjauan Pendidikan: Studi Menuju Era Revolusi Industri. *Pusaka: Journal of Tourism, Hospitality, Travel and Business Event*, *2*(1), 1–8. https://doi.org/10.33649/pusaka.v2i1.40

Álvarez, L., & Coolsaet, B. (2020). Decolonizing Environmental Justice Studies: A Latin American Perspective. *Capitalism Nature Socialism*, *31*(2), 50–69. https://doi.org/10.1080/10455752.2018.1558272

Asefa, A. (2017). Indigenous Knowledge: As A Panacea for Natural Resource Conservation The Case of Ethiopia - Review. *International Journal of Advanced Technology and Innovative Research*, *09*(12), 2047–2052. https://www.ijatir.org/uploads/254136IJATIR16002-390.pdf

Astawa, I. G. (2025). Exploring Ecolinguistics: A New Paradigm for Tourism English Learning. *Englisia : Journal of Language, Education, and Humanities*, *12*(2), 116–136. https://doi.org/10.22373/ej.v12i2.27648

Aziz, M. B., Fitriani, Nurhasanah, R., Abidin, A. A., Dwiyama, F., & Toha, M. (2024). Cultural Heritage as a Driver of Educational Choices: Evaluating the Role of Bugis Values in the Selection of Islamic Private Schools in Indonesia. *Nazhruna: Jurnal Pendidikan Islam*, *7*(3), 726–741. https://doi.org/10.31538/nzh.v7i3.110

Bai, H. (2020). A Critical Reflection on Environmental Education During the COVID-19 Pandemic. *Journal of Philosophy of Education*, *54*(4), 916–926. https://doi.org/10.1111/1467-9752.12472

Baker, B., & Lee, D. (2020). Solidarity and Workplace Engagement: A Management Perspective on Cultivating Community. *Humanistic Management Journal*, *5*(1), 39–57. https://doi.org/10.1007/s41463-020-00084-9

Burbano, D. V., Valdivieso, J. C., Izurieta, J. C., Meredith, T. C., & Ferri, D. Q. (2022). "Rethink and reset" tourism in the Galapagos Islands: Stakeholders' Views on the Sustainability of Tourism Development. *Annals of Tourism Research Empirical Insights*, *3*(2), 1–12. https://doi.org/10.1016/j.annale.2022.100057

Caparrós-Martínez, J. L., Martínez-Vázquez, R. M., & Valenciano, J. P. (2022). Analysis and Global Research Trends on Nautical Tourism and Green Coastal Infrastructures: The Case of Coral Reefs and Seagrass Meadows. *Environmental Sciences Europe*, *34*(33), 1–13. https://doi.org/10.1186/s12302-022-00614-2

Cholil, S., & Parker, L. (2021). Environmental Education and Eco-Theology: Insights from Franciscan Schools in Indonesia. *Environmental Education Research*, *27*(12), 1759–1782. https://doi.org/10.1080/13504622.2021.1968349

Coll-Ramis, M. À., Horrach-Rosselló, P., Genovart-Balaguer, J., & Martinez-Garcia, A. (2024). Research progress on the role of education in tourism and hospitality: A bibliometric analysis. *Journal of Hospitality & Tourism Education*, *36*(4), 320–332. https://doi.org/10.1080/10963758.2023.2180377

Deets, S., Rodgers, V., Erzurumlu, S., & Nersessian, D. (2020). Systems Thinking as a Tool for Teaching Undergraduate Business Students Humanistic Management. *Humanistic Management Journal*, *5*(2), 177–197. https://doi.org/10.1007/s41463-020-00091-w

Dolnicar, S., & Demeter, C. (2024). Why Targeting Attitudes Often Fails to Elicit Sustainable Tourist Behaviour. *International Journal of Contemporary Hospitality Management*, *36*(3), 730–742. https://doi.org/10.1108/IJCHM-07-2022-0828

Edwards, S. (2020). Allowing Ourselves to Reimagine Ecologically Responsible Futures for Education Research and Practice Globally: Critiquing the Limitations Imposed by Christian Hegemony. *ECNU Review of Education*, *3*(1), 164–168. https://doi.org/10.1177/2096531120908129

Efthimiou, S. G. (2025). The Trends of Tourism Sector After Covid-19 Period: a Study of Strategy and Implications. *Corporate and Business Strategy Review*, *6*(1), 119–133. https://doi.org/10.22495/cbsrv6i1art12

Emayomi, D., & Mkpado, S. (2025). Perception and Practice of Individual Environmental Responsibility in Selected Niger Delta Communities. *International Journal of Innovative Science and Research Technology*, *10*(6), 2634–2641. https://doi.org/10.38124/ijisrt/25jun1624

Fei, G., Xiong, K., Fei, G., Zhang, H., & Zhang, S. (2023). The Conservation and Tourism Development of World Natural Heritage Sites: The Current Situation and Future Prospects of Research. *Journal for Nature Conservation*, *72*, 126347. https://doi.org/10.1016/j.jnc.2023.126347

Firdausi, C. L., Sugiyarto, K. H., & Maulana, Y. (2023). Development of Electronic Student Worksheets Based on Learning Cycle 7E (E-SW 7E) and Its Effect on the Students' Concept Understanding and Science Process Skills. *Jurnal Penelitian Pendidikan IPA*, *9*(5), 3862–3868. https://doi.org/10.29303/jppipa.v9i5.3690

Ginting, S., Wongta, A., Ounjaijean, S., & Hongsibsong, S. (2025). Indonesia's Indigenous Suku Anak Dalam: Knowledge for Food and Environmental Sustainability. *Frontiers in Sustainable Food Systems*, *9*(1587094), 1–15. https://doi.org/10.3389/fsufs.2025.1587094

Harrahap, D., & Santiago, P. V. S. (2024). Agroforestry and Local Wisdom: Enhancing Resilience and Carbon Sequestration in Indonesia. *Assyfa Journal of Farming and Agriculture*, *1*(2), 8–13. https://doi.org/10.61650/ajfa.v1i2.191

Hidayati, E., Latifah, S., Setiawan, B., Valentino, N., Rizqi, M., & Mahendra, L. K. (2022). Pengembangan Desa Labuhan Bajo Kabupaten Sumbawa menjadi Desa Wisata Edukasi Mangrove Berbasis Anak Muda dengan Pendekatan Active Citizens. *Jurnal PEPADU*, *3*(2), 166–178. https://doi.org/10.29303/pepadu.v3i2.2466

Huang, C. C., & Lin, W. R. (2023). How does Tourist Learning Affect Destination Attachment in Nature-Based Tourism: Multiple Mediations Comparison and Distal Mediation Analysis. *Journal of Outdoor Recreation and Tourism*, *43*(100665), 1–9. https://doi.org/10.1016/j.jort.2023.100665

Ilyas, I., Rani, F. A., Bahri, S., & Sufyan, S. (2023). The Accommodation of Customary Law to Islamic Law: Distribution of Inheritance in Aceh from a Pluralism Perspectives. *Samarah*, *7*(2), 897–919. https://doi.org/10.22373/sjhk.v7i2.15650

Ismail, I., Hendri, N., & Nurhakim, P. R. (2023). Minangkabau's Doro Tradition: Coexistence of Customary Law and Islamic Law in Caning Punishment. *Samarah*, *7*(1), 579–601. https://doi.org/10.22373/sjhk.v7i1.15904

Jacoba, R. C. (2025). Sacred Ties to Ancestral Land: Reclaiming Indigenous Practices in Environmental Stewardship in the Cordillera. *Media: Jurnal Filsafat Dan Teologi*, *6*(1), 1–30. https://doi.org/10.53396/media.v6i1.519

Karakanta, A. (2025). Accessibility Literacy: Increasing Accessibility Awareness among Young Content Creators. *Human-Computer Interaction*, *arXiv:2508*. https://doi.org/10.48550/arXiv.2508.06512

Kataya, A. (2020). Impact of Tourism Activities on Sustainable Community Development. *Proceedings of the International Conference on Economics and Social Sciences*, 694–704. https://doi.org/10.2478/9788395815072-069

Khan, N., Hassan, A. U., Fahad, S., & Naushad, M. (2020). Factors Affecting Tourism Industry and its Impacts on Global Economy of the World. *SSRN*, *3559353*, 1–32. https://doi.org/10.2139/ssrn.3559353

Li, X., Abbas, J., Dongling, W., Baig, N. U. A., & Zhang, R. (2022). From Cultural Tourism to Social Entrepreneurship: Role of Social Value Creation for Environmental Sustainability. *Frontiers in Psychology*, *13*(925768), 1–16. https://doi.org/10.3389/fpsyg.2022.925768

Luetz, J. M. (2024). Can Indigenous Ecotheology Save the World? Affinities between Traditional Worldviews and Environmental Sustainability. *Climate and Development*, *16*(8), 730–738. https://doi.org/10.1080/17565529.2024.2305883

Mahlil, M., Mustaqim, M., Fatimah, F., & Furqan, M. (2021). Pengelolaan Sampah Berbasis Masyarakat menjadi Produk Bernilai Ekonomi (Studi di Gampong Nusa Kecamatan Lhoknga Kabupaten Aceh Besar). *Jurnal Al-Ijtimaiyyah*, *7*(1), 65. https://doi.org/10.22373/al-ijtimaiyyah.v7i1.9473

Mardapi, D. (2012). *Pengukuran, Penilaian, dan Evaluasi Pendidikan*. Nuha Medika.

Martinez, C. (2022). Developing 21st Century Teaching Skills: A Case Study of Teaching and Learning Through Project-Based Curriculum. *Cogent Education*, *9*(1), 2024936. https://doi.org/10.1080/2331186X.2021.2024936

Mawar, S., & Iqbal, M. (2025). Multicultural Dispute Resolution System in Aceh Before and After the Issuance of the Customary Institution Qanun. *Samarah*, *9*(1), 560-574. https://doi.org/10.22373/sjhk.v9i1.19767

Mbah, M. F., & Ezegwu, C. (2024). The Decolonisation of Climate Change and Environmental Education in Africa. *Sustainability (Switzerland)*, *16*(3744), 1–24. https://doi.org/10.3390/su16093744

Mbah, M., Ajaps, S., & Molthan-Hill, P. (2021). A systematic Review of the Deployment of Indigenous Knowledge Systems towards Climate Change Adaptation in Developing World Contexts: Implications for Climate Change Education. *Sustainability (Switzerland)*, *13*(4811), 1–24. https://doi.org/10.3390/su13094811

Miles, M. B., Huberman, A. M., & Saldaña, H. (2014). *Qualitative Data Analysis* (III). SAGE Publications, Inc.

Mulya, T. W., & Salvi, F. (2024). 'Grass, rice, and Aubergine': A Case Study of an Islamic Eco-Pesantren in Indonesia. *Pedagogy, Culture & Society*, *33*(4), 1437–1455. https://doi.org/10.1080/14681366.2024.2385049

Nofriya, N., & Fadhly, A. (2020). Isu Konservasi Lingkungan pada Kegiatan Pariwisata di Kabupaten Padang Pariaman. *Jurnal Sains Dan Teknologi: Jurnal Keilmuan Dan Aplikasi Teknologi Industri*, *20*(2), 154–161. https://doi.org/10.36275/stsp.v20i2.279

Parker, L. (2017). Religious Environmental Education? The New School Curriculum in Indonesia. *Environmental Education Research*, *23*(9), 1249–1272. https://doi.org/10.1080/13504622.2016.1150425

Pirson, M., Vázquez-Maguirre, M., Corus, C., Steckler, E., & Wicks, A. (2019). Dignity and the Process of Social Innovation: Lessons from Social Entrepreneurship and Transformative Services for Humanistic Management. *Humanistic Management Journal*, *4*(2), 125–153. https://doi.org/10.1007/s41463-019-00071-9

Rachman, A., Yochanan, E., Samanlangi, A. I., & Hery Purnomo. (2024). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Saba Jaya Publisher.

Rambe, Y. S., Nasution, A. M., & Kastoro, P. (2022). Perancangan Kawasan Agro-Eco-Edu Tourism pada SMA 2 Plus Panyabungan. *Mejuajua: Jurnal Pengabdian Pada Masyarakat*, *2*(1), 20–29. https://doi.org/10.52622/mejuajuajabdimas.v2i1.44

Rangkuti, R. P., Ketaren, A., & Ridwan, D. (2020). Modal Sosial dan Kearifan Lokal dalam Pengelolaan Hutan: Studi Kasus di Kawasan Hutan Gampong Kunci Kecamatan

Sawang Kabupaten Aceh Utara. *Jurnal Sosiologi USK (Media Pemikiran & Aplikasi)*, *14*(2), 163–180. https://doi.org/10.24815/jsu.v14i2.18894

Ransfield, A. K., & Reichenberger, I. (2021). Māori Indigenous Values and Tourism Business Sustainability. *AlterNative: An International Journal of Indigenous Peoples*, *17*(1), 49–60. https://doi.org/10.1177/1177180121994680

Safrina, S. (2015). Partisipasi Masyarakat dalam Pengelolaan Wilayah Pesisir di Aceh. *Jurnal Hukum Lingkungan Indonesia*, *2*(1), 30–49. https://doi.org/10.38011/jhli.v2i1.19

Sari, L. P. D. U. C., Agustini, K., & Pradnyana, I. M. A. (2019). Efektivitas Model Pembelajaran Tuntas dalam E -Modul Berbasis Project Based Learning. *Jurnal Nasional Pendidikan Teknik Informatika*, *8*(1), 35–48. https://doi.org/10.23887/janapati.v8i1.16962

Sarmento, C. (2020). Tourism as Intercultural Business: Locating Concepts and Questioning Identities. *European Journal of Sustainable Development*, *9*(3), 400–415. https://doi.org/10.14207/ejsd.2020.v9n3p400

Satria, A., & Aldi, T. (2023). Analisis Keberlanjutan Lingkungan dalam Pengembangan Sektor Pariwisata: Perspektif Ekonomi Lingkungan di Destinasi Wisata. *JISOSEPOL: Jurnal Ilmu Sosial Ekonomi Dan Politik*, *1*(1), 16–23. https://doi.org/10.61787/0vgy2953

Shabalala, N. P. (2025). Decolonising Environmental Education in Africa Through the Early Integration of Indigenous Knowledge Systems Guided by Zibanjwa Zisemaphuphu. *Discover Sustainability*, *6*(892), 1–24. https://doi.org/10.1007/s43621-025-01822-5

Shukri Nordin, Z., Ruslan, I., Yusriadi, Hamzah, N., & Darmadi, D. (2025). Integrating Islamic Law and Customary Law: Codification and Religious Identity in the Malay Buyan Community of Kapuas Hulu. *Journal of Islamic Law*, *6*(1), 89–111. https://doi.org/10.24260/jil.v6i1.3410

Sihombing, I. H. H., Suastini, N. M., & Puja, I. B. P. (2024). Sustainable Cultural Tourism in the Era of Sustainable Development. *International Journal of Sustainable Competitiveness on Tourism*, *3*(02), 100–115. https://doi.org/10.34013/ijscot.v3i02.1601

Sihombing, R. A., Anwar, S., Liu, S. Y., Muslim, M., Winarno, N., & Sihombing, P. J. (2025). Integrating Local Wisdom into Environmental Education: A Systematic Review of Ethnoscience Research in Indonesia. *Journal of Natural Science and Integration*, *8*(1), 57–74. https://doi.org/10.24014/jnsi.v8i1.35762

Simarmata, D. P., & Indrawati, D. R. (2022). Using Local Wisdom for Climate Change Mitigation. *IOP Conference Series: Earth and Environmental Science*, *1109*(1), 1–8. https://doi.org/10.1088/1755-1315/1109/1/012004

Suraijiah, S., Rusdiah, R., & Surawardi, S. (2026). Implementation of Environmental Education in the Concept of Ecotawhid and Ecotheology in Students. *Kharisma: Jurnal Administrasi Dan Manajemen Pendidikan*, *4*(2), 232–245. https://doi.org/10.59373/kharisma.v4i2.113

Tandon, A., Dhir, A., Madan, P., Srivastava, S., & Nicolau, J. L. (2023). Green and Non-Green Outcomes of Green Human Resource Management (GHRM) in the Tourism Context. *Tourism Management*, *98*(104765), 1–17. https://doi.org/10.1016/j.tourman.2023.104765

Tang, M., & Xu, H. (2023). Cultural Integration and Rural Tourism Development: A Scoping Literature Review. *Tourism and Hospitality*, *4*(1), 75–90. https://doi.org/10.3390/tourhosp4010006

Wang, J., Dai, J., Gao, W., Yao, X., Dewancker, B. J., Gao, J., Wang, Y., & Zeng, J. (2024). Achieving Sustainable Tourism: Analysis of the Impact of Environmental Education on Tourists' Responsible Behavior. *Sustainability (Switzerland)*, *16*(552), 1–17. https://doi.org/10.3390/su16020552

Wantik, L., Laksmono, B. S., Lefaan, A., & Lumintang, O. M. (2024). Education System for Indigenous Communities: A Review of Social Ecology. *Indonesian Journal of Advanced Research*, *3*(10), 1593–1604. https://doi.org/10.55927/ijar.v3i10.11944

Xie, J., Abbass, K., & Li, D. (2024). Advancing Eco-Excellence: Integrating Stakeholders' Pressures, Environmental Awareness, and Ethics for Green Innovation and Performance. *Journal of Environmental Management*, *352*(120027), 1–13. https://doi.org/10.1016/j.jenvman.2024.120027

Yanti, I., Yuliatin, Y., Mahmudah, S., Mahluddin, M., & Galuh Larasati, Y. (2025). Negotiating Sharīʿah and Customary Law: Legal Pluralism in Familial Relationships among the Suku Anak Dalam in Jambi. *Journal of Islamic Law*, *6*(2), 177–205. https://doi.org/10.24260/jil.v6i2.3311

Zeyer, A., & Kelsey, E. (2013). Environmental Education in a Cultural Context. In *International Handbook of Research on Environmental Education* (pp. 206–212). Routledge. https://www.zora.uzh.ch/handle/20.500.14742/72182