Dawuh Guru
Jurnal Pendidikan MI/SD

e-ISSN: 2775-5789, ISSN: 2962-746X
Vol. 6 No. 1 Febuari Tahun 2026
DOI: https://doi.org/10.35878/guru.v6i1.1959

Ecotheology as a Framework for IPAS Learning to Build Human Relations with the Environment

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OPEN ACCESS

Submitted : 14 Desember 2025
Accepted : 27 Januari 2026
Published : 28 Febuari 2026
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Cara sitasi: Nurmala, U.I.Z., *et al*. (2026). Ecotheology as a Framework for IPAS Learning to Build Human Relations with the Environment. *Dawuh Guru: Jurnal Pendidikan MI/SD,* 6(1), 37-52. https://doi.org/10.35878/guru.v6i1.1979

Abstrack

This study aims to explore how eco-theology can be integrated into Natural and Social Sciences (IPAS) learning as a framework for fostering primary school students' understanding of the relationship between humans and the environment. Using a library research approach, this study reviewed various literature on environmental education, ecotheology, and science learning to identify patterns, conceptual trends, and the potential for integrating spiritual values into IPAS. The results of the study indicate that ecological relationships, context-based learning experiences, and the instilling of moral-spiritual values are important elements in effective environmental education. These findings were then analysed using Bronfenbrenner's Ecological Systems Theory and eco-theological principles to formulate an integrative model that connects ecological experiences across various student development systems with key eco-theological values, such as ecological monotheism, khilafah, amanah, and mīzān. The model emphasises that integrating ecotheology can shift IPAS learning from a purely cognitive focus to a more holistic, transformative learning process rich in ethical and spiritual values. This research, therefore, contributes a conceptual integrative framework and design propositions for ecotheology-based IPAS learning, which may serve as a theoretical foundation for further empirical validation and model feasibility testing.

Keyword: *Ecotheology; IPAS; Human Ecology; Human–Environment Relations; Sustainability*

A. Introduction

Science education in primary schools ideally helps develop a strong understanding of how humans interact with their environment (Quinn et al., 2015). It is hoped that Ilmu Pengetahuan Alam dan Sosial (IPAS) education will not only provide scientific knowledge but also instill values about the environment that encourage early awareness. Experts emphasise that environmental education should provide students with meaningful learning experiences that foster a strong understanding of their role in the ecosystem (Tilbury, 2004). Therefore, students not only learn about nature, but also learn how to live in harmony with it. This is the foundation that should strengthen their ecological nature.

This ideal becomes even more important when education is supported by a value perspective that provides ethical depth, such as ecotheology. As part of creation, according to ecology, humans have a moral and spiritual responsibility towards the environment (Bradshaw & Bekoff, 2001). This method adds spiritual and affective aspects that are often missing in science learning. It is hoped that students will not only understand the environment but also have a relationship with nature. In this way, education can foster a deeper environmental awareness.

However, global evidence indicates that students' understanding of the human–environment relationship remains limited. UNESCO's Greening Curriculum Guidance (2024), based on international assessments and curriculum reviews, suggests that many primary-level students struggle to explain the causal links between human activities and environmental degradation. In Indonesia, the Environmental Behaviour Index (KLHK, 2023) records a score of 0.57 (on a 0–1 scale), indicating that pro-environmental behaviour has not yet been consistently internalised. These findings point to a gap between curricular aspirations and students' relational ecological understanding.

As a subject that combines natural sciences and social sciences, IPAS has a strategic position in shaping ecological literacy and a holistic understanding of the relationship between humans and their environment (Sharma, 2023). The Merdeka Curriculum positions IPAS as a learning space that emphasises the integration of science, technology, and real-life issues, including increasingly urgent ecological issues (Meylovia & Alfin Julianto, 2023). Due to its multidisciplinary nature, IPAS is expected to foster critical thinking skills, as well as moral and ecological sensitivity, among students from primary school age (Beck, 2024). This great potential makes IPAS an important domain for examining how ecological values can be instilled more deeply and meaningfully. Therefore, IPAS learning was chosen as the research context because it provides an ideal foundation for

exploring the integration of eco-theological perspectives in environmental education.

However, this strategic potential has not been fully realised in school learning practices. The gap is evident in the implementation of IPAS learning, where most teachers still rely on lecture methods, resulting in a learning approach that emphasises cognitive aspects rather than ecological understanding. 62% of primary school teachers are not yet able to integrate environmental education effectively, so students view ecological issues as material that is separate from their lives (Sukma et al., 2020). This condition is even more worrying, as IPAS should be a strategic vehicle for fostering ecological awareness from an early age. The disconnect between the material taught and students' real experiences shows that the quality of IPAS learning requires a deeper reorientation.

This situation emphasises the need for a more holistic approach to IPAS learning. Until now, the cognitive aspect has dominated, while the moral, emotional, and spiritual dimensions have not been adequately addressed, even though research shows that a holistic approach can shape sustainable ecological behaviour (De-Abreu et al., 2022). Various studies show that integrating eco-theology into IPAS learning remains suboptimal because environmental education tends to focus on scientific or character aspects without raising ecological spiritual values that can enrich understanding (Jamiluddin Marpaung, 2024). These limitations reveal a gap in the development of IPAS learning concepts, while also emphasising the urgency of presenting a more comprehensive theoretical analysis of ecotheology's contribution to strengthening meaningful, contextual learning rooted in holistic ecological awareness.

A literature review indicates that the IPAS curriculum has not yet clearly established ecotheology as a theoretical foundation. Existing research remains fragmented and has not integrated human ecology theory, ecotheology, and pedagogy into a coherent whole. Developing pedagogical innovation requires addressing this research gap to advance learning. Opportunities to build learning experiences focused on ecological awareness will be hampered if this gap remains unaddressed. Therefore, developing an ecotheology-based conceptual framework is very important.

Based on this gap, this study aims to examine the role of ecotheology as the foundation of IPAS learning to develop a better understanding of the relationship between humans and the environment. This study focuses on a theoretical analysis of how ecotheology can broaden perspectives and enrich the design of IPAS learning. Additionally, this study seeks to offer a new perspective for developing more in-depth and comprehensive learning. It is

hoped that the findings will advance environmental education in Indonesia and serve as a conceptual basis for emerging ecological learning innovations.

B. Method

This study employs a qualitative method using library research. This approach was selected because the goal is to develop a conceptual framework for integrating ecotheology into IPAS learning by analyzing, interpreting, and synthesizing relevant literature. An in-depth review of theories, concepts, and findings from previous studies on human ecology, ecotheology, and the human-environment relationship was conducted.

The research data sources included scientific books, journal articles, official agency reports, and other academic documents. The literature search initially identified 52 articles from Google Scholar, ScienceDirect, DOAJ, SpringerLink, and SINTA. The selection process used the following criteria: (1) relevance to eco-theology, human relationships with the environment, and IPAS learning; (2) publication between 2014 and 2024; and (3) peer-reviewed quality. After a thorough screening—eliminating duplicates, evaluating content depth, and assessing focus—12 articles met the criteria and became the primary sources for this study. Several classic works were also included for their significant contribution to strengthening the concept.

Data collection was conducted through digital and manual searches using keywords such as ecotheology, environmental education, human–environment relations, ecological literacy, and IPAS learning. The collected literature was then classified based on theme, research focus, and relevance to the study objectives. This process made it easier for researchers to trace conceptual patterns and gaps in the existing literature, especially regarding the integration of ecotheological values in science learning in elementary schools.

Data analysis was conducted using content analysis techniques across three main stages: data reduction, data presentation, and conclusion drawing. In the reduction stage, literature was selected and grouped according to core themes such as human ecology, ecotheology, human-environment relations, IPAS pedagogy, and the relevance of values education. In the presentation stage, the data were mapped into concepts, intertheoretical relationships, and key findings from the literature. The final stage involved drawing conclusions, leading to an integrative conceptual framework of the role of ecotheology in strengthening IPAS learning.

Data validity is maintained through source triangulation by comparing various literature to ensure consistency of information. Researchers also apply critical reading techniques to assess the credibility, relevance, and depth of each source's contribution. With this procedure, the research results have a strong, valid, and scientifically accountable argumentative basis. The

validation process ensures that the research findings make a significant conceptual contribution to the development of more meaningful environmental education..

C. Results and Discussion

Research Results

This section presents the results of research obtained through the analysis of 12 open-access articles relevant to eco-theology, human-environment relations, and IPAS learning. The analysis was conducted by reviewing the main focus, thematic findings, and educational implications that emerged from each article. The research results are compiled into a summary table to help readers identify key patterns. Furthermore, the table is explained narratively to help the research findings be better understood. Based on the summary and narrative explanation, this study then draws several key findings that form the basis for discussion in the next section.

a. Summary of Article Analysis

The following table presents the synthesis results for 12 open-access articles selected at the method stage. This table contains the year and author of the article, article title, main focus, thematic findings, and implications for IPAS learning based on eco-theology.

Table 1.
Summary of Article Analysis

No.	Year & Author(s)	Article Title	Main Focus	Implications for IPAS Learning
1	(Conradie, 2020)	*The Four Tasks of Christian Ecotheology: Revisiting the Current Debate*	Formulation of four normative tasks of Christian ecotheology in responding to the ecological crisis.	IPAS learning needs to integrate scientific analysis of the environment with reflection on moral and spiritual values and responsibilities.
2	(Stevenson et al., 2017)	*What Is Climate Change Education ?*	Transformative climate change education	Supports transformative and value-based IPAS learning
3	(Ardoin et al., 2020)	*Environmental education outcomes for conservation: A systematic review*	Environmental education outcomes and conservation behavior	Strengthens ecological literacy dimension in IPAS

4	Mahrus (2024)	*Integrating Islamic Values with Ecological Awareness: A Study of Transformative Islamic Education*	Spirituality in education	IPAS should provide space for value-based reflection
5	Vargas et al. (2019)	*Project-Based Learning to Enhance Environmental Education through Automobile Mechanics*	Project-Based Learning (PjBL)	IPAS is well-suited to project-based learning approaches
6	Bloom & Fuentes (2019)	*Experiential Learning for Enhancing Environmental Literacy Regarding Energy: A Professional Development Program for In-service Science Teachers*	Experiential learning	IPAS should include observation and environmental exploration activities
7	Bintang Kejora et al. (2025)	*Ekopesantren: An Ecology-Based Education Model with Local Wisdom Supporting the Sustainable Development Goals*	Local wisdom	Islamic values can be contextualized through local wisdom in IPAS learning
8	Ull et al. (2014)	*Perceptions and Attitudes of Teacher-Training Students towards Environment and Sustainability*	Teacher capacity	Teacher training is needed to integrate ecotheology into IPAS
9	Glasser (2011)	*Naess's Deep Ecology: Implications for the Human Prospect and Challenges for the Future*	Ecological philosophy	IPAS should encourage reflective understanding of ecological relationships
10	Parker (2017)	*Religious Environmental Education? The New School Curriculum in Indonesia*	Religion–ecology integration	The use of religious texts and eco-friendly practices is relevant for Madrasah Ibtidaiyah

11	Aisyi et al. (2025)	*Analysis of Holistic Education from Intellectual, Emotional, Psychomotor, and Spiritual Perspectives*	Holistic pedagogy	IPAS should be designed using a holistic learning framework
12	UNESCO (2024)	*Greening Curriculum Guidance*	Ecological attitudes	IPAS requires value-based interventions to build relational understanding

Table 1 presents five key articles that represent various perspectives on human–environment relations, eco-theology, ecological literacy, and pedagogical approaches in science education. Each article is analyzed based on its main focus, thematic findings, and implications for IPAS learning. Through this mapping, it is evident that each source highlights the importance of relational, moral, spiritual, and pedagogical dimensions as the foundation of transformative environmental education. Furthermore, the table shows that ecological values do not originate solely from scientific approaches but also from theological, spiritual, and recontextualized educational perspectives. Overall, this table serves as a basis for synthesizing findings and formulating an integrative IPAS learning framework.

Research Findings

Based on the synthesis of the 12 articles in the table, the following are the five main findings.

1) The relationality between humans and the environment is at the core of all literature.

   All articles indicate that environmental education cannot be understood merely as a transfer of knowledge, but rather as a process of building meaningful relationships between humans and nature. Ardoin et al. (2020) show that the outcomes of environmental education include the integration of knowledge, attitudes, skills, and conservative behavioural tendencies. Stevenson et al. (2017) emphasise the importance of reflective and contextual learning in understanding the complexity of socio-ecological realities.

   Within the framework of ecotheology, Conradie (2020) formulates four main tasks of ecotheology, namely the analytical dimension (diagnosing the ecological crisis), the normative dimension (formulating ethical values), the constructive dimension (developing theological reflections on the relationship between humans and creation), and the practical dimension (leading to concrete ecological actions). These four dimensions

show that the relationship between humans and the environment is not only ecological, but also moral and practical.

These findings reinforce the need for IPAS learning to integrate scientific analysis of the environment with value reflection and an orientation towards ecological action.

2) The moral and spiritual dimensions are important foundations of ecological awareness.

   Conradie (2020) shows that the response to the ecological crisis in ecotheology includes not only an analysis of the causes of environmental damage, but also the formulation of ethical norms and practical orientations that guide ecological action. Thus, environmental issues are understood not only as technical-scientific problems, but also as matters of values and moral responsibility.

   In line with this, Mahrus (2024) shows that integrating spiritual values into education strengthens students' ecological awareness. These findings confirm that eco-theology makes a conceptual contribution to enriching the IPAS learning framework by integrating ethical and spiritual dimensions.

3) The pedagogical approach needs to be active, contextual, and transformative.

   Stevenson et al. (2017) emphasise that climate change education is not sufficient to be delivered solely through scientific information, but requires space for dialogue, critical reflection, and student engagement in understanding the social implications of environmental issues. Vargas et al. (2019) show that project-based learning and direct experience can increase student engagement and ecological understanding. These findings indicate that effective IPAS learning models should be experience-based and contextual, and encourage reflection that deepens students' understanding of environmental issues.

4) The connection between scientific concepts, experiences, and values needs to be strengthened.

   Ardoin et al. (2020) show that environmental education outcomes that impact conservation behaviour occur when knowledge is linked to attitudes and practical skills. Stevenson et al. (2017) also emphasise that scientific understanding becomes more meaningful when linked to social experiences and the context of students' lives. These findings indicate that IPAS learning needs to integrate scientific concepts with concrete experiences and value dimensions so that it does not stop at mere content mastery.

5) There is a great opportunity to integrate ecotheology into IPAS learning.

Conradie (2022) and Mahrus (2024) show that spiritual values such as trustworthiness, equality among creatures, and sustainability awareness can be used as the basis for ecological ethics. The implication for IPAS is the need to integrate value dimensions into learning design, for example, through ethical reflection, contextual dialogue, or strengthening theological principles in understanding human-environment relations. These findings reinforce the research direction that eco-theology can serve as a conceptual framework to enrich IPAS learning.

Discussion

a. Human-Environment Relationality as the Foundation for Integrating Ecotheology into IPAS

Research findings indicate that human–environment relationality is at the core of contemporary environmental education. Ardoin et al. (2020), through a systematic review of various environmental education studies, show that learning outcomes that impact conservation behaviour are formed through the integration of knowledge, attitudes, skills, and behavioural dispositions. These findings confirm that human-environment relations are not only built through conceptual understanding, but through the interconnection between cognitive dimensions and behavioural orientation.

In the context of pedagogy, Stevenson et al. (2017) emphasise that climate change education needs to help students understand the interconnection between science and complex socio-ecological realities. This means that relationality is not only understood as an ecological structure, but as an awareness formed through reflective and dialogical processes.

This idea aligns with the concept of ecological literacy, which emphasises the importance of understanding the interconnection between natural systems and human responsibility towards them (Orr, 1989), as well as with sustainability education, which encourages a shift in learners' perspectives (Tilbury, 2004). Thus, integrating ecotheology into IPAS strengthens this relational orientation by introducing dimensions of meaning and value into learning.

Within the framework of Bronfenbrenner's Human Ecology Theory, the quality of human-environment relationships is formed through concrete experiences in microsystems, such as home and school (Paquette & Ryan, 2020). Therefore, IPAS learning needs to provide direct ecological experiences so that relationality develops as a life experience, not just a conceptual abstraction.

b. Moral-Spiritual Ethics of Ecotheology as an Orientation for IPAS Learning

The moral and spiritual dimensions constitute an important finding from the literature analysis. Conradie (2020), through his formulation of the four tasks of ecotheology—analytical, normative, constructive, and practical—emphasises that responding to ecological crises requires ethical discernment and theological reflection, not merely scientific explanation—ecotheology therefore situates ecological responsibility within a broader moral and spiritual framework.Within this perspective, environmental degradation is not only a technical problem but also a moral challenge that demands value-based orientation and transformative action.

Ecotheology views humans as an integral part of the web of creation, and ecological actions as a form of moral and spiritual obligation. Principles such as ecological monotheism, khilafah, amanah, and mīzān provide a strong ethical framework for explaining why humans need to maintain ecological balance (Ali & Agushi, 2024). Integrating these values into IPAS learning allows students to understand the environment not only as an object of scientific study but as an important part of life that must be cared for responsibly.

IPAS learning that integrates eco-theology can help overcome the anthropocentric tendency in science education, which often prioritizes mechanistic explanations. By providing space for spiritual reflection, environmental ethics discussions, and religious interpretations of natural phenomena, IPAS can encourage students to develop an ecological awareness rooted in values. This aligns with Mahrus's (2024) findings, which show that integrating religious values into education can increase students' ecological sensitivity and sense of responsibility towards the environment.

In addition, integrating moral spirituality into IPAS has the potential to foster transformative learning, as Tilbury (2004) emphasizes. Transformative education not only changes knowledge but also alters students' perspectives and behavior. When eco-theological values are combined with scientific concepts, students not only learn how nature works, but also why they must act ethically towards it. Thus, IPAS can serve as a vehicle for shaping students' ecological character based on spiritual ethics and relational awareness.

c. The Synergy of Human Ecology and Ecotheology as an Integrative Framework for IPAS Learning

The synergy between Human Ecology theory and ecotheology creates a strong conceptual foundation for the development of IPAS

learning design. Human Ecology theory provides a structural understanding of how human relations with the environment are shaped through cross-system interactions, while ecotheology provides a normative orientation on human responsibility for caring for the environment. The integration of the two produces a pedagogical approach that considers not only ecological mechanisms but also the accompanying spiritual and moral values.

Research findings show that current IPAS learning still tends to emphasize cognitive aspects and has not fully developed holistic ecological relationships. The project-based learning model developed by Vargas et al. (2019) demonstrates the effectiveness of participatory approaches in improving students' ecological understanding. When this approach is combined with ecotheological values, project activities not only produce scientific skills but also raise awareness of spiritual responsibility towards nature. This makes IPAS learning more meaningful and has a long-term impact on students' ecological behavior.

By combining these two theories, IPAS can be directed towards learning that fosters an understanding of the relationship between humans and the environment through three main dimensions: ecological experience (human ecology), moral-spiritual meaning (eco-theology), and ecological action (project-based approach and real action). This approach shows that integrating eco-theology into IPAS does not merely add religious value to learning but also provides a holistic framework that strengthens science learning by incorporating essential ethical and spiritual dimensions.

d. Human Ecology-Based Integrative Ecotheology-IPAS Model

The integrative model developed in this study outlines how Bronfenbrenner's ecological system can be combined with ecotheological principles in IPAS learning. In the microsystem, direct ecological experiences serve as the starting point for forming a relational understanding. Environmental observation, simple practices, and interaction with natural phenomena provide opportunities for students to experience ecological interconnectedness in concrete terms. The integration of values such as trust and gratitude enriches the meaning of these experiences, making them moral-spiritual rather than merely scientific.

At the mesosystem level, collaboration among schools, families, and communities is important for strengthening ecological values (Priatmoko & Sholihah, 2023). Environmental projects involving various social actors help students understand that protecting the environment is a shared responsibility. The integration of eco-theology at this level occurs

through dialogue between home and school, as well as the application of the principle of balance (mīzān) in everyday life. Thus, the mesosystem functions as a bridge between students' direct experiences and the values that develop in the community.

At the exosystem and macrosystem levels, school policies and cultural-religious values provide the context that strengthens IPAS learning grounded in ecotheology. Schools can become eco-pedagogical spaces that encourage ecological behavior through eco-school programs, environmental management, and the integration of ecological values into the curriculum. Spiritual values, such as ecological monotheism and khilafah, serve as the orientation for IPAS themes such as ecosystems, environmental change, and recycling. At the chronosystem level, the integration of ecotheology is understood as a continuous process that shapes students' ecological behavior through long-term reflection and consistent ecological habits.

e. Implications of Integrating Ecotheology into IPAS Learning

The integration of ecotheology into IPAS has significant implications for the development of learning in elementary schools. First, this integration broadens the orientation of IPAS learning from merely imparting scientific knowledge to a process of forming holistic ecological awareness. Learning becomes a space for instilling sustainable ecological relationships, values, and behaviors (Gisore, 2023).

Second, integrating ecotheology enriches IPAS with ethical and spiritual dimensions that are in harmony with Indonesia's religious and socio-cultural context. This makes IPAS more relevant to students' lives and more effective in character building.

Third, this integrative model makes a theoretical contribution to the field of education, namely that science learning can be developed in a transdisciplinary manner by combining the natural and social sciences with spiritual values. IPAS no longer stands as a subject that only teaches concepts, but as a vehicle for shaping ecological personalities.

Fourth, in practical terms, the eco-theology–IPAS integration framework provides teachers with guidelines for designing learning activities that combine scientific exploration, environmental experiences, collaborative work, and value reflection.

Thus, this study confirms that integrating ecotheology is not merely a complement to IPAS learning but a conceptual approach that enriches the structure, substance, and orientation of learning. This approach can build a deep relational understanding of humans and the environment while fostering a sustainable ecological ethic among students.

D. Conclusion

This study conceptually explores the integration of ecotheology into IPAS (Natural and Social Sciences) learning by systematically synthesising relevant literature. The analysis indicates that strengthening students' relational understanding of the human–environment relationship requires the integration of three main dimensions: ecological relationality, moral-spiritual orientation, and contextual-transformative pedagogy.

The findings suggest that environmental learning becomes more meaningful when scientific understanding is connected with ethical reflection and action-oriented experiences. Integrating ecotheological perspectives into IPAS provides a value-based orientation that complements scientific inquiry, enabling learning to move beyond cognitive mastery toward the formation of ecological awareness rooted in responsibility and balance.

This study proposes an integrative conceptual framework that combines human ecology and ecotheology as a foundation for developing holistic IPAS learning in elementary education. The framework positions ecological experience, value internalisation, and reflective action as interconnected components that foster sustainable ecological consciousness.

Theoretically, this research contributes to the development of transdisciplinary science education by offering a structured model for embedding spiritual-ethical dimensions within environmental learning. Practically, it offers conceptual guidance for teachers in designing IPAS learning activities that integrate scientific exploration, ecological engagement, collaboration, and reflective value formation.

Future studies are recommended to empirically examine the implementation and feasibility of this conceptual framework in classroom settings to validate its pedagogical relevance further.

E. Acknowledgements

The author would like to thank the supervisors, teachers at the research partner schools, and all parties who have supported the implementation of this research.

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