

Eco-Pesantren Initiatives: A Comparative Study between Indonesia and Malaysia

Muhammad Haikal Malisan
Universitas Islam Negeri K.H. Abdurrahman Wahid Pekalongan
E-mail: haikalmalisan95@gmail.com

Abstract

Environmental degradation has heightened the urgency for educational institutions to contribute to sustainability efforts, including Islamic boarding schools (pesantren) in Indonesia and pondok or tahfiz schools in Malaysia. This study compares Eco-Pesantren initiatives in both countries to examine how Islamic ecological values rooted in concepts such as tauhid (unity), khalifah (stewardship), and mizan (balance) are translated into practical sustainability programs. Using a qualitative comparative case study, the research investigates four institutions recognized for their environmental engagement: Pesantren Lirboyo and Pesantren An-Nur II Al-Murtadlo in Indonesia, and Maahad Tahfiz Negeri Pahang (MTNP) and Pondok Moden Sg. Durian in Malaysia. Data were collected through document analysis, semi-structured interviews, and on-site observations. The findings reveal two distinct models of Islamic sustainability practice. Indonesian pesantren adopt a community-driven, experiential approach characterized by student-led waste management, organic agriculture, and integrative religious ecological learning supported by movements such as Pesantren Ramah Lingkungan. In contrast, Malaysian institutions demonstrate a policy-aligned and structured model shaped by national guidelines, standardized green-campus programs, and frequent collaborations with universities and environmental agencies. Despite these contextual differences, both countries emphasize Islamic ecological ethics to cultivate responsibility, stewardship, and spiritual awareness among students. The study concludes that Eco-Pesantren initiatives play a significant role in shaping environmentally conscious Muslim youth and demonstrate the potential of Islamic education as a driver of sustainability. Strengthening regional collaboration, policy alignment, and standardized but adaptable green curricula is recommended to enhance the broader impact of Eco-Pesantren networks in Southeast Asia.

Keywords: Eco-Pesantren, Islamic ecological ethics, sustainability education, comparative study, Southeast Asia.

Introduction

Environmental degradation, climate instability, and the decline of ecological resilience continue to pose significant global challenges, prompting education systems worldwide to integrate sustainability into their instructional and institutional frameworks. Within the Muslim world, Islamic educational institutions particularly pesantren in Indonesia and pondok in Malaysia hold strategic potential to advance sustainability initiatives due to their holistic learning environment, cultural authority, and strong moral–spiritual orientation. One such

development is the emergence of Eco-Pesantren, an integrated model that embeds environmental stewardship into religious education, institutional governance, and community practices.

Islamic ecological scholarship emphasizes that environmental crises are not merely technical problems but moral and spiritual failures resulting from the erosion of human responsibility (*amanah*) and the disruption of the divine balance (*mizan*) (Nasr, 1996; Foltz, 2003). Foundational concepts such as *tawhid*, *khalifah* (stewardship), *islah* (rectification), and *himaayah al-bi'ah* (environmental protection) establish a comprehensive ethical framework for sustainable living (Abdul-Matin, 2010; Abu Sayem, 2021). These principles validate the role of Islamic educational institutions as transformative agents capable of cultivating ecological ethics among younger generations.

A growing body of literature demonstrates that pesantren in Indonesia possess unique capacity to shape environmental behavior through religious instruction, communal life, and autonomous institutional governance. Herdiansyah (2018) and Kejora (2025) show how Eco-Pesantren initiatives strengthen environmental consciousness through experiential practices such as waste management, organic agriculture, and renewable energy utilization. Similar transformations are documented in Malaysia, where Islamic educational institutions increasingly adopt structured environmental programs aligned with national policies and academic collaborations (Nursaniah, 2025; Rahman, 2022).

However, despite shared theological foundations, the operationalization of Eco-Pesantren varies significantly between Indonesia and Malaysia. Indonesian programs tend to be community-driven and locally adaptive, emerging from partnerships with NGOs and government initiatives such as Pesantren Ramah Lingkungan (Fatmawati, 2021). In contrast, Malaysian pondok and Islamic schools employ policy-driven and formalized models, guided by the Ministry of Education's Green School framework and supported by university partnerships (Ministry of Education Malaysia, 2021; Yusoff et al., 2022). These differences highlight the influence of governance systems, institutional autonomy, and socio-cultural contexts on how Islamic ecological principles are translated into educational practice.

Despite the growing literature on Islamic environmental ethics, comparative empirical research between Indonesian and Malaysian Eco-Pesantren remains limited. Most existing studies focus on single-country analyses, specific case studies, or theoretical discussions (Al-Jayyousi, 2022; Setiawan et al., 2022). There is a notable gap in cross-country research that systematically examines how governance structures, curriculum models (Yuliangsih & Hasanah, 2024), and institutional strategies shape the operationalization of Eco-Pesantren across different Islamic educational ecosystems in Southeast Asia.

To address this gap, the present study investigates four Islamic educational institutions selected through purposive sampling based on their documented environmental engagement. In Indonesia, the research sites include Pesantren Lirboyo (Kediri, East Java) and Pesantren An-Nur II Al-Murtadlo (Malang, East Java), both nationally recognized for their Eco-Pesantren initiatives such as waste-management systems, organic agriculture, and renewable energy programs supported by local environmental agencies (MoEF, 2022; Sholihah & Mualifah, 2023). In Malaysia, the study examines Maahad Tahfiz Negeri Pahang (MTNP), Kuantan and Pondok Moden Sg. Durian, Kelantan, institutions known for their structured green-campus

programs, formal environmental education modules, and partnerships with universities for sustainability training (Yusoff et al., 2022; Rahman & Abdullah, 2024).

Participants included school leaders, environmental program coordinators, curriculum developers, and students involved in sustainability activities. The inclusion of multiple stakeholder groups follows best practices in environmental education research and ensures the capture of multilayered institutional perspectives (Tilbury, 2011; Kejora, 2025).

Accordingly, this study aims to:

1. Analyze Eco-Pesantren practices implemented in selected Islamic boarding schools in Indonesia and Malaysia
2. Compare institutional approaches, curriculum integration, environmental programs, and policy supports across the four institutions
3. Identify shared challenges, best practices, and opportunities for strengthening Islamic sustainability education at the regional level.

Grounded in earlier scholarship, the study hypothesizes that while Indonesian and Malaysian Eco-Pesantren share a strong theological foundation rooted in Islamic ecological ethics, their program structures differ significantly due to contextual policy environments and institutional governance systems. By addressing these objectives, this research contributes to the development of comparative Islamic environmental education and strengthens the role of pesantren and pondok as influential agents of ecological transformation in Southeast Asia.

Methods

Research Design

This study employed a qualitative comparative case study design to examine the implementation of Eco-Pesantren initiatives in Indonesia and Malaysia. This design is appropriate for analyzing educational and socio-cultural phenomena that differ across institutional and national contexts, as it enables the identification of similarities and variations in practices, curriculum integration, environmental ethics, and policy support structures (Al-Jayyousi, 2022). The comparative approach is widely used in sustainability and environmental education research to explore how contextual factors shape institutional meaning-making and program implementation (Foltz, 2003). A qualitative comparative design is also recognized as suitable for investigating complex cultural, religious, and institutional dynamics within Islamic educational settings, where practices are deeply embedded in local traditions and governance structures (Herdiansyah, 2018; Rohmah, 2024). Prior studies highlight that sustainability initiatives in pesantren exhibit significant contextual variation, thereby requiring interpretive and flexible methodological approaches rather than quantitative generalizations (Fitriani et al., 2024; Lirboyo Eco-Pesantren, 2024). Accordingly, this research adopts a qualitative-comparative design to generate a nuanced understanding of how Eco-Pesantren programs are operationalized across different educational environments.

Participants

The research was conducted in four Islamic educational institutions selected through purposive sampling based on their documented environmental engagement. In Indonesia, the selected sites were Pesantren Lirboyo (Kediri, East Java) and Pesantren An-Nur II Al-Murtadlo (Malang, East Java), both recognized nationally for their Eco-Pesantren initiatives, including

waste-management systems, organic agriculture, and renewable-energy programs (Ministry of Environment and Forestry (MoEF, 2022; Sholihah & Mualifah, 2023). These institutions were chosen due to their active participation in national programs such as *Pesantren Ramah Lingkungan* and their collaborations with local environmental agencies (Fatmawati, 2021).

In Malaysia, the research sites were Maahad Tahfiz Negeri Pahang (MTNP), Kuantan and Pondok Moden Sg. Durian, Kelantan, both of which have implemented structured green-campus programs endorsed by the Ministry of Education (Ministry of Education Malaysia, 2021). Their environmental efforts include organic farming, waste-to-compost systems, green curriculum development, and partnerships with universities for sustainability training (Yusoff et al., 2022; Rahman & Abdullah, 2024).

Participants consisted of school leaders, environmental program coordinators, curriculum developers, and students involved in sustainability activities. The inclusion of multiple stakeholder groups aligns with best practices in environmental education research, allowing for multilayered and context-sensitive perspectives to emerge (Kejora, 2025; Tilbury, 2011).

Research Procedures

The study followed three main procedures: (1) institutional profiling, (2) data triangulation, and (3) cross-case thematic comparison.

Institutional profiling was conducted for all four sites Pesantren Lirboyo, Pesantren An-Nur II Al-Murtadlo, Maahad Tahfiz Negeri Pahang (MTNP), and Pondok Moden Sg. Durian by gathering information from official documents, school websites, sustainability reports, and program descriptions. This step follows profiling practices commonly used in Islamic sustainability research (Al-Jayyousi, 2022). The profiling focused on the institutions' environmental initiatives such as waste management, organic farming, green curriculum design, and policy-driven sustainability programs.

Triangulation involved validating data across three sources: institutional documents, semi-structured interviews, and observational notes. This methodological triangulation strengthens trustworthiness in qualitative environmental research (Sulismadi et al., 2023). Since many Islamic sustainability practices such as biogas use in Pesantren An-Nur II and green-campus modules in MTNP are not always comprehensively documented, triangulation was essential to clarify discrepancies between policy and practice (Nursaniah, 2025; Foltz, 2003).

The final procedure, cross-case thematic comparison, examined differences and similarities between the Indonesian and Malaysian institutions. This approach follows the analytic sequence used in environmental education and comparative Islamic sustainability studies: coding, pattern identification, theme consolidation, and interpretive cross-case analysis (Al-Jayyousi, 2022; Nursaniah, 2025).

Data Collection Technique(s)

Three data collection techniques were used:

1. Document Analysis

Documents analyzed included Eco-Pesantren profiles from Pesantren Lirboyo and An-Nur II, green-campus guidelines from MTNP and Sg. Durian, curricular materials, and policy frameworks from the Indonesian Ministry of Environment and the Malaysian Ministry of Education. Document analysis is foundational for

contextualizing Islamic educational settings and sustainability practices (Herdiansyah, 2018).

2. Semi-Structured Interviews

Interviews were conducted with school leaders, environmental program coordinators, curriculum developers, and students. This technique enables flexibility and depth, especially needed to capture institution-specific practices such as community-driven initiatives at Indonesian pesantren and policy-based sustainability at Malaysian schools (Nursaniah, 2025).

3. Observation

On-site observations documented waste management facilities, composting areas, organic gardens, learning spaces, and student participation in environmental activities. Observation provides direct insight into implementation quality and aligns with sustainability case-study methodologies (Kejora, 2025).

Ethical procedures included informed consent, confidentiality agreements, and institutional approval from each participating school.

Data Analysis Technique

The data in this study were analyzed using thematic analysis, a methodological approach widely applied in sustainability studies and Islamic environmental ethics due to its ability to combine textual, observational, and interview-based evidence into a coherent interpretive structure (Foltz, 2003). The analysis followed the six established phases of thematic analysis: familiarization, coding, theme generation, review, definition, and reporting. During the familiarization phase, all documents, interview transcripts, and observational field notes from the four research sites Pesantren Lirboyo and Pesantren An-Nur II Al-Murtadlo in Indonesia, and Maahad Tahfiz Negeri Pahang (MTNP) and Pondok Moden Sg. Durian in Malaysia were read repeatedly to identify preliminary patterns relevant to Eco-Pesantren practices.

Coding was conducted using a combined inductive–deductive strategy. Inductive coding allowed data-driven patterns to emerge organically from each institution, capturing context-specific phenomena such as “student-led waste segregation,” “community farming initiatives,” and “policy-driven curriculum implementation.” At the same time, deductive coding was guided by established Islamic ecological concepts, including *khalīfah* (stewardship), *iṣlāḥ* (rectification), and *ḥimāyah al-bi’ah* (environmental protection), which served as analytical anchors across the four cases (Nasr, 1996). This dual coding approach strengthened analytic rigor, ensuring that both emergent and theory-informed insights were incorporated.

Following the coding process, cross-case analytic comparison was employed to examine institutional similarities and differences between Indonesian and Malaysian Eco-Pesantren models. This comparative analysis highlighted the contrast between Indonesia’s community-driven, flexible, and participatory sustainability practices and Malaysia’s structured, policy-regulated, and curriculum-driven approach. Such cross-case analysis aligns with comparative environmental and Islamic education research frameworks that emphasize the influence of governance systems, institutional autonomy, and national policy environments on sustainability implementation (Al-Jayyousi, 2022). The final themes were refined and synthesized to construct an integrated interpretation of how Islamic ecological ethics are operationalized across the four institutions.

Results and Discussion

The results of this study are organized into two major thematic outcomes: (1) institutional strategies and environmental program implementation, and (2) curriculum integration and the internalization of Islamic environmental ethics. These results were derived from cross-case analysis across the four research sites in Indonesia and Malaysia.

Outcome 1: Institutional Strategies and Environmental Program Implementation

Indonesia: Pesantren Lirboyo & Pesantren An-Nur II Al-Murtadlo

Both Indonesian pesantren demonstrate community-driven Eco-Pesantren models grounded in participatory environmental practices and locally initiated innovations. The analysis shows several key initiatives: student-led waste segregation systems, composting and organic waste processing at Pesantren Lirboyo, biogas utilization and organic agricultural units at Pesantren An-Nur II, environmental halaqah and Qur’anic study circles reinforcing stewardship ethics.

These practices align with the literature emphasizing how Indonesian pesantren mobilize grassroots participation and experiential ecological engagement as part of religious formation (Herdiansyah, 2018; Maghfiroh, 2024). Both institutions also receive support from community networks, NGOs, and local environmental agencies through programs such as *Pesantren Ramah Lingkungan*.

Malaysia: MTNP & Pondok Moden Sg. Durian

In contrast, the Malaysian institutions exhibit policy-structured environmental governance models, reflecting national sustainability frameworks under the Ministry of Education. Their documented initiatives include standardized green-campus assessments (MTNP), waste-to-compost programs, formal sustainability modules referencing Islamic ecological principles, regulated environmental campaigns and school-wide enforcement mechanisms.

These findings align with research demonstrating that Malaysia’s sustainability implementation is top-down and policy-driven, supported by ministerial guidelines and university partnerships (Nursaniah, 2025; Rahman, 2022).

Cross-case Comparison

The comparative analysis reveals clear structural distinctions:
 Indonesian pesantren: flexible, adaptive, community-centered environmental practices.
 Malaysian institutions: structured, standardized, policy-regulated sustainability frameworks.
 These differences reinforce the argument that national governance environments shape how Islamic institutions operationalize sustainability (Al-Jayyousi, 2022; Widiastuty et al., 2025).

Table 1. Institutional Characteristics of Eco-Pesantren Models in Indonesia and Malaysia

Component	Indonesia (Pesantren)	Malaysia (Pondok/Islamic Schools)
Governance Model	Community-based, bottom-up	Policy-driven, top-down
Program Focus	Waste management, green farming, student participation	Green campus policy, institutional regulation

External Support	NGOs, local government, civil society	Ministry of Education, universities
Flexibility	High (contextual adaptation)	Moderate (policy-guided)

The table shows clear organizational differences between the two contexts. Indonesian pesantren display greater flexibility and creativity, whereas Malaysian institutions demonstrate stronger administrative coherence and standardization. While both countries embed sustainability within Islamic ethical values, Indonesia demonstrates a bottom-up, locally adapted model, whereas Malaysia applies a top-down, policy-regulated framework. This distinction supports Widiastuty et al. (2025), who emphasize that cultural and administrative structures significantly shape the operationalization of Islamic environmental ethics across Southeast Asian Muslim communities.

Outcome 2: Curriculum Integration and Internalization of Islamic Environmental Ethics

The second key finding demonstrates that both Indonesian and Malaysian institutions integrate Islamic environmental ethics into their curricula, although through pedagogical approaches that differ significantly across contexts. In Indonesia, pesantren embed ecological values within traditional religious subjects such as fiqh, tafsir, and akhlaq, supported by contextual and experiential learning methods. This integration is reflected through Qur'anic interpretation sessions highlighting stewardship (*khalifah*), *bay'ah* lingkungan rituals at Pesantren An-Nur II, and practical curriculum-linked activities involving organic agriculture and renewable energy programs. These practices confirm previous research showing that pesantren naturally internalize ecological ethics through lived religious practice and community engagement (Kejora, 2025). Such experiential approaches demonstrate how Indonesian pesantren integrate environmental teachings into daily routines and contextual learning environments, reinforcing findings that pesantren education effectively links religious values with environmental stewardship (Kejora, 2025).

In contrast, Malaysian institutions employ a more formalized and structured approach to curriculum integration. Environmental ethics are incorporated through standardized modules and environmental education courses endorsed by the Ministry of Education and JAKIM. These modules explicitly reference Islamic ecological principles such as *khalifah*, *mizan*, and *himayah al-bi'ah*, delivered through systematically designed lessons and standardized assessments. This model aligns with broader sustainability studies indicating that Malaysia demonstrates strong curriculum formalization and institutional regulation in delivering environmental education (Ahmad et al., 2025; Foltz, 2003). Malaysian institutions also integrate environmental themes within official syllabi, reinforcing consistency and policy alignment in sustainability instruction.

Interview and observation data across the four institutions reveal distinct pathways of environmental awareness formation. Indonesian students primarily develop ecological consciousness through experiential participation, such as managing waste segregation systems, organic farming units, and renewable energy projects. Meanwhile, Malaysian students develop awareness through structured doctrinal instruction, with ecological values taught explicitly in classrooms through formal modules and guided learning activities. This contrast reinforces Nasr's (1996) distinction between experiential-spiritual and doctrinal-intellectual pathways in

Islamic moral development, demonstrating that pedagogical orientation plays a crucial role in shaping how environmental ethics are internalized by learners.

These differences in pedagogical orientation are further illustrated in the modes of curriculum integration identified across the four institutions. As shown in Figure 1, Indonesian pesantren adopt a contextual and experiential pathway, whereas Malaysian institutions follow a structured, policy-based instructional model.

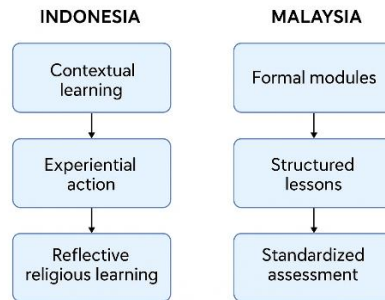


Figure 1. Modes of Curriculum Integration

Figure 1 illustrates the distinct pathways through which Indonesian and Malaysian Islamic educational institutions integrate environmental ethics into their curricula. In Indonesia, curriculum integration follows a contextual and practice-based progression—beginning with contextual learning tied to local environmental challenges, followed by hands-on experiential action such as waste management and organic farming, and culminating in reflective religious learning that internalizes ecological values through halaqah, tafsir sessions, and daily routines. In contrast, Malaysian institutions employ a more structured and policy-driven pathway, beginning with formal modules endorsed by the Ministry of Education and JAKIM, implemented through standardized lessons, and reinforced by institutionalized assessment mechanisms. This comparison highlights the broader pedagogical differences between the experiential–spiritual model characteristic of Indonesian pesantren and the doctrinal–instructional model prevalent in Malaysian Islamic schools.

Overall, both Indonesia and Malaysia demonstrate a strong commitment to grounding their environmental curricula in Islamic ethical principles. Despite this shared theological foundation, substantial differences emerge in strategy, structure, and pedagogical delivery. Indonesian pesantren rely on flexible, community-based, and experience-driven models that embed ecological values within daily practice. In contrast, Malaysian institutions operationalize environmental ethics through structured, policy-guided curricula with clear administrative frameworks. These findings highlight that the primary divergence between the two contexts is not theological orientation but differences in governance systems, institutional autonomy, and educational cultures, all of which shape how sustainability is taught, practiced, and internalized within Islamic educational settings.

Discussion of findings

The findings of this study highlight how Islamic educational institutions in Indonesia and Malaysia operationalize Islamic ecological ethics through their respective Eco-Pesantren initiatives. Although the four institutions share a common theological foundation rooted in *khalifah* (stewardship), *işlah* (rectification), and *hımayah al-bi'ah* (environmental protection),

their models of implementation differ substantially due to variations in governance systems, institutional autonomy, and national policy environments. These differences confirm the theoretical claim that contextual factors play a decisive role in shaping the practical embodiment of Islamic environmental ethics (Al-Jayyousi, 2022; Foltz, 2003).

In Indonesia, Pesantren Lirboyo and Pesantren An-Nur II Al-Murtadlo represent community-driven Eco-Pesantren models characterized by strong grassroots participation, local innovation, and collaboration with NGOs and local government agencies. These institutions operationalize sustainability through experiential learning activities such as waste segregation, organic farming, biogas production, and environmental religious gatherings. Such practices illustrate the synergy between ecological engagement and moral formation that is central to pesantren education, reinforcing Herdiansyah's (2018) assertion regarding the institutional autonomy of pesantren and Maghfiroh's (2024) findings on lived ecological practices in Islamic boarding schools. This grassroots orientation demonstrates how Indonesian pesantren respond adaptively to local environmental challenges, integrating ecological ethics directly into daily religious and educational life.

Conversely, Malaysian institutions Ma'had Tahfiz Negeri Pahang (MTNP) and Pondok Moden Sg. Durian demonstrate a more structured, policy-driven model of environmental education. Their programs align closely with national frameworks such as the Green School Initiative issued by the Ministry of Education and are supported by collaborations with universities. Sustainability is operationalized through formal modules, standardized assessments, and green-campus regulations that ensure compliance and institutional accountability. These findings support Nursaniah's (2025) argument that Malaysia's Islamic educational institutions rely on centralized policy frameworks to maintain consistency in sustainability implementation. The Malaysian model highlights how environmental ethics can be institutionalized through curriculum formalization and regulatory oversight rather than community participation.

Comparing these patterns reveals two distinct pathways of Islamic environmental pedagogy. The experiential–spiritual pathway dominant in Indonesia emphasizes practice-based learning, emotional engagement, and the internalization of ecological morality through lived experience. Meanwhile, the doctrinal–instructional pathway found in Malaysia emphasizes structured knowledge transmission, standardized curricula, and policy compliance. This duality mirrors Nasr's (1996) framework on Islamic moral development and demonstrates how theological principles can manifest differently depending on educational governance and cultural settings.

The theoretical implications of these findings are threefold. First, Islamic eco-theology provides a flexible ethical foundation that can be adapted to diverse institutional contexts without losing its theological coherence. Second, the contrast between Indonesia's decentralized autonomy and Malaysia's centralized regulation strengthens comparative Islamic education literature by showing two parallel but effective models for sustainability implementation. Third, the results demonstrate that Islamic educational institutions can incorporate sustainability without compromising religious identity, whether through innovative grassroots programs or structured policy-guided curricula.

From a practical perspective, the study indicates promising opportunities for cross-country collaboration. Indonesian pesantren could benefit from Malaysia's strong policy

alignment, which enhances sustainability continuity and institutional accountability. Conversely, Malaysian institutions may adopt Indonesia's community-centered strategies, which promote student engagement, creativity, and context-sensitive environmental action. Such complementary strengths suggest the potential for developing regional Eco-Pesantren networks, joint curriculum initiatives, and collaborative sustainability training across Southeast Asia.

Despite offering substantial insights, this study has limitations. The small sample of four institutions limits broader generalizations, and the qualitative design relies heavily on document analysis, interviews, and observations that may introduce interpretive bias. Future research should expand the sample size, employ mixed-methods approaches, and include longitudinal studies to evaluate long-term ecological behavioral outcomes among students. Additionally, quantitative indicators such as carbon footprint assessments, waste reduction metrics, or curriculum impact evaluations would strengthen evidence of program effectiveness.

In conclusion, this study affirms that while Eco-Pesantren initiatives in Indonesia and Malaysia are grounded in shared Islamic environmental ethics, their operationalization varies according to governance structures, educational cultures, and socio-political contexts. These differences reveal how Islamic ethical principles are adapted into practical sustainability models. Strengthening collaboration between the two countries may lead to the development of a comprehensive regional framework for Islamic environmental education one that integrates theological depth with institutional effectiveness and practical innovation.

Conclusion

This study concludes that Eco-Pesantren initiatives in Indonesia and Malaysia, while rooted in the same Islamic ecological principles *khalifah* (stewardship), *išlah* (rectification), and *himayah al-bi'ah* (environmental protection) manifest in distinct institutional forms shaped by differing governance structures, cultural contexts, and educational traditions. The shared theological foundation provides a robust ethical platform for promoting sustainability in both countries, yet the operationalization of these principles reveals clear contrasts. Indonesian pesantren, such as Pesantren Lirboyo and Pesantren An-Nur II Al-Murtadlo, adopt a community-driven, flexible, and adaptive model characterized by experiential learning, local innovation, and strong grassroots participation. In contrast, Malaysian institutions, namely MTNP and Pondok Moden Sg. Durian, integrate sustainability through structured, policy-driven frameworks supported by national educational authorities, standardized modules, and institutional regulation.

These findings demonstrate that the development of Eco-Pesantren models is not determined solely by religious teachings, but is profoundly influenced by national policy environments, institutional governance, and socio-cultural dynamics. The study contributes theoretically by confirming that Islamic environmental ethics serve as a universal moral foundation, while their practical implementation remains context-dependent. Practically, the findings underscore the potential for cross-country collaboration, where Indonesia's experiential and community-centered strengths can complement Malaysia's policy coherence and curriculum formalization to produce a more comprehensive and regionally applicable model of Islamic sustainability education.

The study also validates its initial hypothesis: although Indonesia and Malaysia share comparable Islamic ecological values, the structure, delivery, and governance of their environmental programs diverge significantly due to contextual and regulatory differences. These contrasts highlight opportunities for mutual learning, shared resource development, and the formulation of regional Islamic environmental education frameworks.

Nonetheless, several limitations must be acknowledged. The small number of research sites restricts the generalizability of the findings, and the qualitative design limits the measurement of program effectiveness through quantitative indicators. Future research should expand the institutional sample, incorporate mixed-methods approaches, and conduct longitudinal analyses to examine long-term ecological awareness and behavioral change among students. Broader comparative studies across Southeast Asia would further enhance understanding of the role Islamic educational institutions play in advancing global sustainability agendas.

Overall, this study reaffirms the strategic role of Islamic boarding schools as agents of ecological transformation. By integrating theological values with contextually grounded institutional strategies, Indonesian and Malaysian Eco-Pesantren demonstrate the significant potential of Islamic education to cultivate environmentally responsible Muslim generations and contribute meaningfully to sustainability efforts within the Muslim world.

Acknowledgments

The author would like to express sincere gratitude to the Islamic boarding schools and educational institutions in Indonesia and Malaysia that participated in this study and generously provided access to their documents, programs, and insights. Appreciation is also extended to the academic advisors, colleagues, and reviewers who offered valuable feedback throughout the research process. Support from institutional partners and the availability of academic resources greatly contributed to the completion of this study. The author acknowledges that all contributions have been essential to strengthening the analysis and ensuring the academic rigor of this work.

Conflict of interests

The author declares that there is no conflict of interest associated with the research, authorship, or publication of this paper. All procedures were conducted independently, without the influence of external agencies, sponsors, or parties that might affect the objectivity and integrity of the findings.

References

- Abdul Matin, I. (2010). *Green Deen: What Islam teaches about protecting the planet*. Berrett-Koehler.
- Abu Sayem, M. (2021). Islam and environmental ethics: A Qur'ānic approach. *Islamic Studies*, 60(2), 157–172.
- Ahmad, V. I., Ali, N., & Zuhriyah, I. A. (2025). Islamic values in environmental school culture: Character formation and challenges. *Edukasi: Jurnal Pendidikan dan Pembelajaran*, 6(1), 267–280.

- Albar, M. K., Hamami, T., & Sukiman, S. (2024). Ecological Pesantren as an innovation in Islamic religious education curriculum: Is it feasible? *Jurnal Edukasi Islamika*, 9(1).
- Al-Jayyousi, O. R. (2022). Re-thinking sustainable development within Islamic worldviews: A systematic literature review. *Sustainability*, 14(12), 7300. <https://doi.org/10.3390/su14127300>
- Azka, M. S. T. (2025). Education based on sustainable development in Islamic boarding schools. *ICRSE Proceedings*, UIN Sunan Kalijaga.
- Bahtiar, A. (2025). Integrating Eco-Sufi values into environmental education. *Journal of Islamic Education Research*, 3(1), 112–124.
- Cambridge University Press. (2024). *Islam and Environmental Ethics* (Cambridge Elements Series).
- Ekopesantren Indonesia. (n.d.). Eco-Pesantren Program Description. <https://ekopesantren.com/>
- Fatmawati, L. (2021). Implementasi program Pesantren Ramah Lingkungan di Jawa Timur. *Jurnal Pendidikan Islam*, 10(2), 155–170.
- Febriyanti, R., Hasan, N., & Mahfud, A. (2025). Islamic reflections on climate crisis and human responsibility. *Dakwah & Islamic Outreach*, 3(1), 55–70.
- Fitriani, N., Zaki, M., Kabalmay, T., Huda, M., & Baihaki, M. (2024). Integration of SDGs in pesantren: Building ecological awareness among santri. *International Journal of Research and Community Empowerment*, 3(2), 83–90.
- Foltz, R. C. (Ed.). (2003). *Islam and ecology: A bestowed trust*. Harvard University Press.
- Herdiansyah, H. (2018). Eco-Pesantren as a basic forming of environmental moral. *Kalam*, 12(2), 289–306.
- Hukamak, M. T. (2025). Integration of social life cycle assessment (S-LCA) to assess social sustainability of Islamic education. *Scaffolding Journal*, 4(1), 55–68.
- Kejora, M. T. B. (2025). Ekopesantren: An ecology-based education model with local wisdom. *Al-Ishlah*, 17(1), 55–65.
- Khasani, F. (2025). Ecological ethics of the Prophet: A hadith-based approach. UIN Malang Repository.
- Lirboyo Eco-Pesantren. (2024). Contribution of Islamic education to environmental awareness and sustainable development. *Proceedings of Pesantren Studies Conference*, 55–71.
- Maghfiroh, M. (2024). Change, challenge and contribution of Nahdlatul Ulama in environmental conservation: A green pesantren study. *Nazhruna: Jurnal Pendidikan Islam*, 7(1), 80–94.
- Ministry of Education Malaysia. (2021). *Green School Initiative: National guideline for environmental education*. KPM.
- Ministry of Environment and Forestry. (2022). *Laporan tahunan Eco-Pesantren Indonesia*. KLHK Press.
- Mun'im, Z. (2022). Etika lingkungan biosentris dalam al-Qur'an. *Suhuf*, 15(1), 197–221.
- Munawar-Rachman, B. (2024). Islam, education and sustainability: Collaborative approaches for environmental conservation. *APCoMS Journal*, 4(2), 112–125.
- Nasr, S. H. (1996). *Religion and the order of nature*. Oxford University Press.
- Nursaniah, C. (2025). Implementation of Eco-Pesantren through environmental awareness programs. UiTM Institutional Repository.

- Rahardjanto, A. (2025). Islam and sustainability issues: How far has the relationship developed? *Sustainable Research Journal*, 15(1), 1–12.
- Rahman, A. H. A. (2022). E-learning and sustainability of pondok schools. *Sustainability*, 14(18), 11385. <https://doi.org/10.3390/su141811385>
- Rahman, H., & Abdullah, A. (2024). Sustainable campus practices in Malaysian religious schools: A case study of Kelantan and Pahang. *Malaysian Journal of Environmental Management*, 28(1), 33–48.
- Rohmah, F. N. (2024). Integration of ecological principles in the pesantren system: An analysis of sustainability and environmental conservation practices. *Molang: Journal of Islamic Education*, 2(2), Article 813.
- Saky, S. A. T. (2024). A bibliometric analysis of Islam's role in sustainable development research. *Prisma Sains*, 12(1), 45–60.
- Sa'edi, M. (2025). The role of PAI in shaping environmental responsibility: A case study at An-Nidhamiyah Islamic boarding school. *Fikroh Journal*, 4(1), 22–35.
- Setiawan, H., Kurniawan, N. I., & Santoso, P. (2022). The ecotheological movement of the Muhammadiyah Environmental Council in response to environmental governance crisis. *Millah: Journal of Religious Studies*, 21(2), 345–368.
- Sholihah, N., & Mualifah, S. (2023). Environmental awareness and waste-management practices in Indonesian Islamic boarding schools. *Journal of Islamic Education Studies*, 7(1), 45–60.
- Suprianto, B. (2023). Islamic ecological principles in Muslim environmentalism narratives for religious moderation in Indonesia. *Insight Journal*, 5(1), 45–60.
- Sulismadi, S., Soedarwo, V. S. D., & Salam, A. (2023). Transformasi karakter santri melalui edu-ecoliteracy Islami sebagai instrumen pesantren Muhammadiyah dalam mendukung SDGs. *Sosial Politik*, 11(3), 200–214.
- Syukri, S. (2023). Integration of Islamic values with environmental ethics in pesantren education: A case study at Darularafah Raya Pesantren. *Jurnal Pendidikan Islam*, 13(1), 1–12.
- Tilbury, D. (2011). Education for sustainable development: An expert review of processes and learning. UNESCO.
- Transformation of Local Wisdom & ESG in Pesantren. (2025). Islamic environmental leadership model. *Proceeding of Islamic Education Summit*, 45–55.
- Widiastuty, L., Basri, S., Adnan, Y., Syamsul, M. A., & Indar, I. (2025). Islamic environmental ethics: A cultural framework for sustainable resource management and global ecological stewardship. *Diversity*, 17(1), Article 1223.
- Yusoff, M., Aziz, S., & Hashim, R. (2022). Integrating environmental education in Malaysian tahfiz institutions: Policy and practice. *International Journal of Islamic Education*, 14(3), 112–130.
- Yuliangsih, D. H., & Hasanah, F. N. (2024). Apprentice Teachers Build Students creativity Through a Joyful Stage at Pesantren Darul Amanah, Kendal Central Java. *Andragogi: Jurnal Ilmiah Pendidikan Agama Islam*, 6(November), 1–11.