

The Implementation of Eco-Pesantren Management and Its Implications for Students' Environmental Care Attitudes

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Abstract: This study examines the implementation of eco-pesantren management and its influence on students' environmental care attitudes at Pondok Pesantren Temulus, Mantingan, Ngawi. The increasing environmental crisis requires educational institutions to develop sustainable environmental awareness through integrated educational approaches. In this context, pesantren possess strategic potential to integrate Islamic values with environmental education and ecological character formation. This research employed a qualitative approach using an instrumental case study design. Data were collected through in-depth interviews, observations, and documentation involving pesantren leaders, teachers, student administrators, and students actively participating in eco-pesantren programs. The findings reveal that eco-pesantren management functions, including planning, organizing, implementation, and supervision, were systematically integrated into institutional governance and students' daily activities. The integration of Islamic values such as *khalifah fil ardh*, *amanah*, and *hifz al bi'ah* strengthened students' environmental awareness, ecological responsibility, and collective environmental culture. The study concludes that eco-pesantren represents a transformative Islamic educational management model capable of integrating environmental sustainability, character education, and religious values simultaneously within pesantren life.

Keywords: Eco-pesantren management; ecological culture; environmental care attitudes; Islamic education; sustainability education.

Abstrak: Penelitian ini mengkaji penerapan manajemen eco-pesantren dan pengaruhnya terhadap sikap kepedulian lingkungan para santri di Pondok

ILJ: Islamic Learning Journal (Jurnal Pendidikan Islam)

E-ISSN: 2985-6094. DOI: <https://doi.org/10.54437/ilj>

Prodi PAI Institut Agama Islam Al-Urwatul Wutsqo Jombang

Pesantren Temulus, Mantingan, Ngawi. Krisis lingkungan yang semakin parah menuntut lembaga pendidikan untuk menumbuhkan kesadaran lingkungan yang berkelanjutan melalui pendekatan pendidikan terpadu. Dalam konteks ini, pesantren memiliki potensi strategis untuk mengintegrasikan nilai-nilai Islam dengan pendidikan lingkungan dan pembentukan karakter ekologis. Penelitian ini menggunakan pendekatan kualitatif dengan desain studi kasus instrumental. Data dikumpulkan melalui wawancara mendalam, observasi, dan dokumentasi yang melibatkan pimpinan pesantren, guru, pengurus siswa, serta siswa yang secara aktif berpartisipasi dalam program pesantren ramah lingkungan. Temuan penelitian menunjukkan bahwa fungsi-fungsi manajemen pesantren ramah lingkungan, termasuk perencanaan, pengorganisasian, pelaksanaan, dan pengawasan, telah diintegrasikan secara sistematis ke dalam tata kelola kelembagaan dan kegiatan sehari-hari para siswa. Integrasi nilai-nilai Islam seperti khalifah fil ardh, amanah, dan hifz al bi'ah memperkuat kesadaran lingkungan, tanggung jawab ekologis, dan budaya lingkungan kolektif para siswa. Studi ini menyimpulkan bahwa pesantren ramah lingkungan merupakan model manajemen pendidikan Islam yang transformatif dan mampu mengintegrasikan keberlanjutan lingkungan, pendidikan karakter, dan nilai-nilai agama secara bersamaan dalam kehidupan pesantren.

Kata kunci: Manajemen pesantren ramah lingkungan; budaya ekologis; sikap kepedulian terhadap lingkungan; pendidikan Islam; pendidikan keberlanjutan.

INTRODUCTION

The environmental crisis has emerged as one of the most urgent global challenges of the twenty first century. Climate change, biodiversity loss, environmental pollution, and the depletion of natural resources increasingly threaten ecological stability and human welfare across the world. The United Nations Environment Programme reports that environmental degradation continues to accelerate due to unsustainable patterns of production, consumption, and human behavior, while public ecological awareness remains insufficient in many developing countries. Environmental problems are therefore no longer viewed merely as scientific or technological issues, but also as ethical, cultural, and educational challenges that require transformative changes in human attitudes and social practices. In this regard, educational institutions are expected to play a

strategic role in cultivating ecological awareness, environmental ethics, and sustainable behavior among younger generations¹.

In Indonesia, environmental sustainability has increasingly become part of the national educational agenda. This commitment is reflected in various policy frameworks, including Presidential Regulation Number 59 of 2017 concerning the Implementation of Sustainable Development Goals and Law Number 18 of 2019 concerning Pesantren, which recognizes pesantren as institutions responsible not only for religious transmission but also for social and character development. Within the global framework of Education for Sustainable Development promoted by UNESCO, educational institutions are encouraged to integrate sustainability values into governance, curriculum, and community engagement. In this context, pesantren possess distinctive potential because they operate through a residential educational system that enables continuous character formation through daily interaction, habituation, and institutional culture. From the perspective of Islamic teachings, environmental stewardship is closely associated with the concept of *khalifah fil ardh*, which positions humans as guardians of the earth entrusted with maintaining ecological balance. Likewise, the principle of *hifz al bi'ah* within Islamic jurisprudence frames environmental preservation as a moral and spiritual obligation rather than merely a technical responsibility².

The growing discourse on eco-pesantren reflects increasing awareness regarding the importance of integrating sustainability principles into Islamic educational institutions. Eco-pesantren refers to an educational and managerial model that systematically incorporates environmental values into institutional

¹ Syukri Syukri et al., "Integration of Islamic Values with Environmental Ethics in Pesantren Education: A Case Study at Darularafah Raya Pesantren," *Jurnal Pendidikan Islam* 13, no. 1 (2024): 1-12, <https://doi.org/10.14421/jpi.2024.131.1-12>.

² Sarah Anabarja and Ahmad Safril Mubah, "The Islamic Environmentalism in Eco-Pesantren Initiatives: Integrating the Sustainable Development Values in Islamic Boarding School," *Journal of International Studies on Energy Affairs* 2, no. 1 (2021): 75-90, <https://doi.org/10.51413/jisea.Vol2.Iss1.2021.75-90>.

governance, curriculum development, and students' daily practices. Nevertheless, previous studies have predominantly focused on environmental programs and conservation activities implemented within pesantren, including waste management, greening initiatives, and ecological campaigns³. Existing research largely discusses eco-pesantren from programmatic and conservation perspectives, while limited attention has been directed toward the managerial mechanisms through which pesantren institutionalize ecological values and shape students' environmental care attitudes. Furthermore, only a few studies specifically examine how management functions such as planning, organizing, implementation, and supervision contribute systematically to ecological character formation through the integration of Islamic values, collective habituation, and institutional culture. Consequently, the relationship between eco-pesantren management and the development of students' ecological responsibility remains insufficiently explored within contemporary Islamic educational scholarship.

This issue has become increasingly urgent because environmental degradation continues to intensify while educational institutions are expected to contribute actively toward sustainable development. The challenge faced by pesantren today extends beyond producing students with strong religious competence; pesantren are also expected to cultivate environmentally responsible individuals who possess social awareness and ecological ethics. The relevance of eco-pesantren has become more significant in light of the Sustainable Development Goals, particularly Goal 4 concerning quality education and Goal 13 concerning climate action. Faith based educational institutions are increasingly recognized as important actors in promoting sustainable lifestyles, environmental ethics, and community resilience. This social responsibility is fundamentally rooted in the

³ A Subaidi et al., "Eco-Pesantren: Islamic Education in Forest Conservation Landscapes," *Fudan Journal of the Humanities and Social Sciences* 16, no. 4 (2023): 541–67, <https://doi.org/10.1007/s40647-023-00386-w>; N A Wibowo et al., "Students' Environmental Care Attitude: A Study at Adiwiyata Public High School Based on the New Ecological Paradigm (NEP)," *Sustainability* 15, no. 11 (2023): 8651, <https://doi.org/10.3390/su15118651>.

ILJ: Islamic Learning Journal (Jurnal Pendidikan Islam)

E-ISSN: 2985-6094. DOI: <https://doi.org/10.54437/ilj>

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pesantren's tradition of addressing community issues, often through academic activities like *Bahtsul Masa'il*, which empower students to provide religious and social solutions to contemporary societal problems⁴. In developing countries such as Indonesia, pesantren possess strategic social influence because of their close relationship with local communities and their capacity to shape students' moral behavior through religious values and communal discipline. In the context of Ngawi Regency, environmental management challenges have also been addressed through community-based initiatives, such as the implementation of eco-centric waste bank programs aimed at fostering local environmental empowerment⁵. Therefore, strengthening eco-pesantren management is not only relevant for environmental sustainability but also for the broader development of socially responsible and ecologically conscious citizenship.

Several previous studies have examined the relationship between Islamic education and environmental sustainability. Subaidi et al. analyzed the contribution of eco-pesantren within forest conservation landscapes and emphasized the role of Islamic education in promoting environmental sustainability⁶. Wibowo et al. investigated students' environmental care attitudes using the New Ecological Paradigm framework and demonstrated the importance of educational intervention in shaping ecological awareness⁷. Al-Subaie discussed the integration of Sustainable Development Goals within Islamic higher education institutions, particularly in relation to sustainability oriented educational policies⁸.

⁴ Eko Prasetyo, Syaiful Hanif, and Afifah Puri Rahmawati, "Implementasi Bahtsul Masa'il Dalam Meningkatkan Kemampuan Santri Menjawab Berbagai Permasalahan Di Masyarakat," *Kurikula: Jurnal Pendidikan* 6, no. 2 (2022): 134–49, <https://doi.org/10.56997/kurikula.v6i2.702>.

⁵ Dewi Susilo Reni and Eko Prasetyo, "Community Empowerment through Waste Bank Program as an Eco-Centric Approach to Environmental Management in Jururejo Village, Ngawi Subdistrict," *Indonesia Journal for Community Service and Empowerment* 1, no. 1 (2025): 31–37, <https://doi.org/10.59966/53tz5z54>.

⁶ Subaidi et al., "Eco-Pesantren: Islamic Education in Forest Conservation Landscapes."

⁷ Wibowo et al., "Students' Environmental Care Attitude: A Study at Adiwiyata Public High School Based on the New Ecological Paradigm (NEP)."

⁸ A Al-Subaie, "Integrating the SDGs in Higher Islamic Education: Saudi Arabian Perspectives," *International Journal of Islamic and Middle Eastern Finance and Management* 17, no. 1 (2024): 1–19.

Research published in Ferdinand et al. further revealed that Islamic boarding schools in South Sulawesi contribute positively toward sustainable development through eco-Islamic educational practices⁹. Other studies have explored environmental ethics, eco-theology, and eco-pedagogy within pesantren contexts¹⁰. Although these studies provide important insights, most focus on environmental values, conservation programs, or ecological awareness separately. Limited research specifically investigates eco-pesantren from the perspective of Islamic educational management that integrates institutional governance, ecological culture, and students' environmental care attitudes within a unified analytical framework.

This study offers a different perspective by positioning eco-pesantren not merely as an environmental conservation initiative, but as a comprehensive Islamic educational management model oriented toward ecological character formation and sustainable development. The novelty of this research lies in its emphasis on the strategic role of management functions in institutionalizing environmental values through Islamic teachings, collective habituation, and pesantren culture. Unlike previous studies that primarily discuss environmental programs at the operational level, this research examines how managerial processes contribute to the sustainability of ecological education within pesantren environments. In addition, this study integrates perspectives from Islamic educational management, environmental ethics, and sustainability discourse in order to provide a more holistic understanding of eco-pesantren implementation within contemporary Islamic educational institutions.

⁹ Ferdinan et al., "Eco Islamic Education and Its Contribution to Sustainable Development Goals in Muhammadiyah Boarding Schools of South Sulawesi," *Discover Sustainability*, 2026, <https://doi.org/10.1007/s43621-026-02647-6>.

¹⁰ Syukri et al., "Integration of Islamic Values with Environmental Ethics in Pesantren Education: A Case Study at Darularafah Raya Pesantren"; Siti Aminah and Muhammad Suwignyo Prayogo, "Transforming Islamic Education Through Eco-Pedagogy: Strategic Leadership of Kiai in Pesantren," *MUMTAZ: Jurnal Pendidikan Agama Islam* 5, no. 4 (2026), <https://doi.org/10.69552/mumtaz.v5i4.3621>.

Accordingly, this study addresses the following questions: (1) How are eco-pesantren management functions implemented in establishing environmentally oriented educational governance within pesantren? (2) What strategies are employed to foster students' environmental care attitudes through eco-pesantren programs integrated with Islamic values? and (3) What are the implications of eco-pesantren management for the development of students' ecological culture and environmental responsibility within everyday pesantren life?

METHOD

This study employed a qualitative approach using an instrumental case study design to examine the implementation of eco-pesantren management and its implications for students' environmental care attitudes. A qualitative methodology was selected because the phenomenon under investigation involves social interaction, institutional culture, religious values, and behavioral formation processes that require contextual and interpretative understanding. Quantitative approaches are considered insufficient to capture the complexity of meanings, experiences, and managerial practices embedded within pesantren life. The case study design was adopted because the research focused on a bounded system, namely the implementation of eco-pesantren management within a specific Islamic boarding school environment. This design enabled an in depth exploration of management functions, ecological culture, and students' environmental behavior within their natural setting¹¹.

The research was conducted at Pondok Pesantren Temulus, located in Mantingan, Ngawi, East Java, Indonesia. This pesantren was selected purposively because it actively implements eco-pesantren programs integrated with environmental sustainability practices and Islamic educational values. The

¹¹ Robert K Yin, *Case Study Research and Applications: Design and Methods*, 6th ed. (Sage Publications, 2018); J. D. Creswell, J. W., & Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th Ed.) (SAGE Publications, 2018).

selection of the research site was based on several criteria: (1) the existence of structured eco-pesantren programs, (2) active student participation in environmental preservation activities, (3) the integration of environmental values into institutional culture and daily practices, and (4) the institutional commitment to linking Islamic education with environmental sustainability. The research was conducted for one month, from March to April 2026.

The participants consisted of 15 informants comprising 1 pesantren leader, 2 eco-pesantren program coordinators, 4 teachers, 3 student administrators, and 5 students who were directly involved in environmental activities within the pesantren. Informants were selected using purposive sampling because this technique enables researchers to identify participants who possess relevant knowledge, experience, and direct involvement in the phenomenon under investigation¹². Through this strategy, the study obtained information rich data concerning eco-pesantren management practices and their influence on students' environmental care attitudes.

Data collection was conducted through three primary techniques: semi structured interviews, non participant observation, and documentation review. Semi structured interviews were employed to explore participants' experiences, perceptions, and interpretations regarding eco-pesantren implementation, environmental management strategies, institutional decision making, and the formation of students' ecological awareness. This interview format provided flexibility for participants to elaborate on their experiences while maintaining consistency across interview themes. Interviews were conducted with pesantren leaders, administrators, teachers, and students to obtain diverse perspectives concerning institutional management and ecological practices.

¹² Michael Quinn Patton, *Qualitative Research and Evaluation Methods: Integrating Theory and Practice*, 4th ed. (Thousand Oaks, CA: SAGE Publications, 2015); Sugiyono, *Metode Penelitian Kualitatif* (Bandung: Alfabeta, 2022).

Non participant observation was conducted to obtain direct understanding of environmental activities and behavioral patterns within the pesantren environment without active involvement in the observed activities. Observations focused on students' participation in waste management activities, environmental cleanliness programs, tree planting initiatives, water and energy conservation practices, and the maintenance of pesantren sanitation facilities. In addition, observations examined how environmental values were internalized through daily habituation, institutional discipline, religious activities, and social interaction among students and teachers. Field observations were carried out continuously during the research period to capture the consistency of ecological practices embedded within pesantren life.

Documentation review was conducted to complement interview and observational data. Documents analyzed in this study included pesantren environmental policies, eco-pesantren program schedules, organizational structures, student regulations, photographs of environmental activities, activity reports, and administrative documents related to environmental management. The use of multiple data sources strengthened data richness and enabled triangulation across findings.

Data analysis followed the interactive qualitative analysis model developed by Miles, Huberman, and Saldaña, consisting of data condensation, data display, and conclusion drawing. Data analysis was conducted simultaneously with the data collection process to enable continuous interpretation and refinement of emerging findings. During the data condensation stage, interview transcripts, field notes, and documents were reviewed systematically through open coding, categorization, and thematic interpretation¹³. The coding process focused particularly on managerial

¹³ Matthew B Miles, A Michael Huberman, and Johnny Saldaña, *Qualitative Data Analysis: A Methods Sourcebook*, 3rd ed. (Thousand Oaks, CA: Sage Publications, 2014).

dimensions such as planning, organizing, implementation, supervision, and institutional strategies for ecological character formation.

In the data display stage, categorized findings were organized narratively to facilitate interpretation and identification of relationships among themes. Patterns concerning institutional culture, environmental practices, and students' ecological behavior emerged through iterative comparison between interview results, observational findings, and documentary evidence. Finally, conclusion drawing involved interpreting the meanings of findings and developing analytical explanations grounded in empirical data. This analytical process emphasized contextual understanding and thematic interpretation rather than statistical generalization, which is consistent with the nature of qualitative case study research.

To ensure the credibility and trustworthiness of the findings, several validation strategies were implemented. Source triangulation was conducted by comparing information obtained from different participants, including pesantren leaders, teachers, administrators, and students. Technique triangulation was applied by comparing findings derived from interviews, observations, and documentation. Member checking was also conducted with selected participants to verify the accuracy of interview transcripts and interpretations. In addition, prolonged engagement within the research setting enabled researchers to gain deeper understanding of pesantren culture and environmental practices. These procedures are essential in qualitative research because they enhance the validity, reliability, and authenticity of research findings¹⁴.

The research process was carried out through four interrelated stages: preparation, data collection, analysis, and reporting. During the preparation stage, the researchers identified research problems, reviewed relevant literature,

¹⁴ Creswell, J. W., & Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th Ed.); Patton, *Qualitative Research and Evaluation Methods: Integrating Theory and Practice*.

developed interview guidelines, and prepared observational instruments. Data collection was subsequently conducted in accordance with emerging field conditions and continued until data saturation was achieved. Data analysis was undertaken continuously throughout the research process to ensure alignment between findings and research objectives. Finally, the reporting stage involved organizing findings systematically into scientific narratives and analytical interpretations. Ethical considerations were maintained throughout the study by obtaining informed consent from all participants, ensuring anonymity and confidentiality, respecting participants' voluntary involvement and withdrawal rights, and presenting findings objectively without manipulation or distortion.

RESULTS AND DISCUSSION

1. Eco-Pesantren Management as Institutional Governance

The findings reveal that eco-pesantren at Pondok Pesantren Temulus, Mantingan, Ngawi, functions not merely as an environmental conservation initiative, but as an integrated institutional management system embedded within the governance structure of the pesantren. Since its establishment in 2021, the eco-pesantren program has been developed as a strategic response to environmental challenges within the pesantren environment, particularly plastic waste accumulation, sanitation problems, and the low level of students' environmental awareness. Unlike conventional environmental programs that focus primarily on technical conservation activities, the eco-pesantren model implemented at Pondok Pesantren Temulus integrates environmental sustainability with Islamic educational values and character formation.

The implementation of eco-pesantren management was carried out systematically through the managerial functions of planning, organizing, implementation, and supervision. This finding supports George R. Terry's

management theory, which emphasizes that effective institutional management requires integrated managerial processes to achieve organizational objectives¹⁵. In the context of Pondok Pesantren Temulus, environmental management was not positioned as an additional administrative agenda, but as an integral part of pesantren governance and educational culture.

The planning stage involved pesantren leaders, teachers, eco-pesantren coordinators, and student administrators through annual deliberative meetings. Environmental programs were formulated collaboratively to ensure that implementation reflected institutional needs and students' daily realities. The major programs developed included waste management, environmental greening, organic gardening, water conservation, energy efficiency, and routine communal cleaning activities known as *Clean Friday*. Importantly, these programs were designed not only to improve environmental quality but also to cultivate discipline, collective responsibility, and ecological awareness among students.

Interview findings indicate that participatory planning strengthened students' sense of ownership toward environmental programs. One student administrator explained:

"We are involved in deciding the cleanliness schedule, waste management rules, and environmental activities. Because we participate in planning, students feel responsible for maintaining the programs together."

(Interview with Student Administrator, April 2026)

This finding demonstrates that participatory management contributes positively to institutional sustainability because students perceive environmental programs as collective responsibilities rather than external regulations. Such findings align with participatory educational management

¹⁵ George R Terry, *Principles of Management*, 7th ed. (Homewood, IL: Richard D. Irwin, 1977).

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E-ISSN: 2985-6094. DOI: <https://doi.org/10.54437/ilj>

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theory, which argues that involvement in decision making enhances organizational commitment and collective accountability.¹⁶

The organizational structure of eco-pesantren also played a significant role in ensuring program sustainability. The pesantren established a dedicated eco-pesantren management team under the supervision of pesantren leaders and caregivers. The organizational structure consisted of several divisions responsible for environmental cleanliness, waste management, greening programs, sanitation monitoring, and environmental education. Each division was coordinated by senior students appointed through institutional deliberation.

Table 1. Organizational Structure of Eco-Pesantren Management at Pondok Pesantren Temulus

Division	Main Responsibilities	Coordinators
Environmental Cleanliness	Supervising dormitory and classroom cleanliness	Student administrators
Waste Management	Waste sorting and recycling activities	Eco-pesantren team
Greening Division	Tree planting and garden maintenance	Student volunteers
Water and Energy Conservation	Monitoring electricity and water usage	Sanitation division
Environmental Education	Campaigns and ecological awareness programs	Teachers and student coordinators

The findings show that students functioned not merely as program participants but also as active environmental managers within the pesantren system. This organizational approach reflects principles of student centered management and collaborative leadership within Islamic educational institutions. The active involvement of students strengthened ecological

¹⁶ Tony Bush, *Theories of Educational Leadership and Management*, 5th ed. (London: SAGE Publications, 2020).

responsibility and encouraged the emergence of collective environmental discipline.

From the perspective of Islamic educational management, the success of eco-pesantren governance was strongly influenced by the integration of religious values into institutional management practices. Environmental programs were consistently linked with Islamic teachings concerning *khalifah fil ardh* (human stewardship), *amanah* (trustworthiness), and *hifz al bi'ah* (environmental preservation). The pesantren leadership emphasized that environmental responsibility constitutes part of Islamic moral obligations rather than merely institutional regulations.

One teacher stated:

"Students are taught that protecting the environment is part of worship. Cleanliness is not only about discipline, but also about faith and responsibility before God."

(Interview with Teacher, April 2026)

This finding supports the concept of Islamic eco-theology, which positions environmental preservation as a spiritual and ethical responsibility rooted in Islamic teachings¹⁷. The integration of Islamic values into environmental governance strengthened the legitimacy of eco-pesantren programs because students perceived ecological practices as manifestations of religious devotion.

In addition, the leadership model implemented by pesantren caregivers significantly influenced institutional effectiveness. Observational findings revealed that pesantren leaders regularly participated in communal cleaning activities, greening programs, and environmental campaigns alongside students. Such exemplary conduct reflects the concept of *uswah hasanah* within Islamic education, where leadership through example becomes an

¹⁷ Karman Karman, Rosihon Anwar, and Lukman Hakim, "The Qur'anic Learning Based on Islamic Eco-Theology at Pesantren," *Jurnal Pendidikan Islam* 9, no. 2 (2023): 169–86, <https://doi.org/10.15575/jpi.v9i2.24933>.

ILJ: Islamic Learning Journal (Jurnal Pendidikan Islam)

E-ISSN: 2985-6094. DOI: <https://doi.org/10.54437/ilj>

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effective mechanism for character formation. This finding is consistent with Bandura's social learning theory, which explains that individuals develop behavior through observation and imitation of respected role models¹⁸.

The integration of participatory management, Islamic values, and exemplary leadership enabled eco-pesantren management at Pondok Pesantren Temulus to function not only as an environmental program but also as a transformative educational system. Environmental governance became embedded within institutional culture, daily routines, and students' social interactions. Consequently, eco-pesantren evolved into a holistic management approach that integrated ecological sustainability, Islamic ethics, and character education within pesantren life.

Table 2. Management Functions and Their Implications for Students' Environmental Character

Management Function	Implementation Practice	Character Outcomes
Planning	Participatory environmental program formulation	Responsibility and ownership
Organizing	Student involvement in eco-pesantren divisions	Leadership and collaboration
Implementation	Daily environmental activities and campaigns	Ecological discipline
Supervision	Routine monitoring and evaluation	Consistency and accountability

These findings indicate that eco-pesantren management contributes not only to environmental preservation but also to the formation of ecological culture and students' environmental care attitudes. The institutionalization of environmental values through management functions demonstrates that pesantren possess strategic potential to become faith based educational institutions that support sustainable development and ecological citizenship.

¹⁸ Albert Bandura, *Social Learning Theory* (Englewood Cliffs, NJ: Prentice Hall, 1977).

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2. Ecological Habituation and Environmental Character Formation.

The findings demonstrate that the success of eco-pesantren implementation at Pondok Pesantren Temulus was strongly influenced by the process of ecological habituation embedded within students' daily activities. Environmental awareness was not developed through theoretical instruction alone, but through repetitive practices, collective discipline, and continuous social interaction within the pesantren environment. The twenty four hour educational system characteristic of pesantren created a social environment that enabled the consistent internalization of environmental values through daily habituation. This finding supports Lickona's character education theory, which emphasizes that character formation becomes effective when moral values are transformed into repeated social practices and daily behavioral habits¹⁹.

The habituation process was implemented through various routine environmental activities integrated into pesantren life. These activities included communal cleaning programs, waste sorting, dormitory sanitation duties, tree planting, water conservation, and organic gardening. Such environmental practices were conducted continuously and collectively so that ecological behavior gradually became part of students' everyday routines rather than temporary institutional programs. Observational findings revealed that many students automatically disposed of waste in designated bins, participated in cleaning activities without direct instruction, and actively reminded peers to maintain environmental cleanliness.

One student explained:

"At first, some students cleaned the environment only because of the rules. But after getting used to it every day, maintaining cleanliness became a normal habit for us."
(Interview with Student, April 2026)

¹⁹ Thomas Lickona, *Educating for Character: How Our Schools Can Teach Respect and Responsibility* (New York: Bantam Books, 2013).

This finding indicates that ecological habituation contributed significantly to transforming students' environmental behavior from external compliance into internalized awareness. In Islamic educational contexts, habituation (*ta'wīd*) has long been recognized as an important method for character development because repeated behavior gradually shapes moral consciousness and personal discipline. Therefore, environmental activities within the pesantren functioned not only as conservation practices but also as mechanisms for ecological character formation.

The findings further reveal that the collective culture of pesantren strengthened the effectiveness of environmental habituation. The communal living system encouraged intensive social interaction among students, enabling peer learning, mutual supervision, and collective responsibility. Environmental discipline was reinforced not only through institutional regulations but also through peer culture and social expectations within the pesantren community. Students who neglected cleanliness responsibilities often received reminders or criticism from fellow students, indicating that ecological values had become integrated into collective social norms.

This finding aligns with Bandura's social learning theory, which explains that behavior is formed through observation, imitation, and interaction within social environments²⁰. Students developed environmental awareness partly through observing peers and respected authority figures consistently practicing ecological responsibility. Consequently, ecological behavior gradually became normalized as part of pesantren identity and collective culture.

Table 3. Forms of Ecological Habituation and Character Outcomes

Environmental Activities	Habituation Process	Character Formation
Waste sorting	Conducted daily in dormitories and classrooms	Responsibility and discipline

²⁰ Bandura, *Social Learning Theory*.

Communal cleaning (<i>Clean Friday</i>)	Weekly collective activity	Cooperation and social awareness
Tree planting and gardening	Routine maintenance of green areas	Environmental care and responsibility
Water and energy conservation	Monitoring daily resource usage	Self discipline and accountability
Dormitory sanitation duties	Rotational cleaning schedules	Consistency and collective commitment

In addition to habituation, exemplary leadership (*uswah hasanah*) emerged as an important factor in strengthening students' environmental character. Observational data consistently showed that pesantren leaders, teachers, and senior student administrators directly participated in environmental activities alongside students. Pesantren caregivers regularly joined communal cleaning activities, monitored waste management practices, and encouraged environmental discipline through informal interaction with students. Such exemplary conduct created moral legitimacy for environmental expectations because students perceived ecological responsibility as genuinely practiced by respected authority figures.

One teacher stated:

"Students imitate what they see. If teachers and pesantren leaders care about cleanliness and environmental responsibility, students will gradually follow the same behavior."
(Interview with Teacher, April 2026)

This finding confirms Bandura's argument that role models significantly influence behavioral development through observational learning processes. Within pesantren culture, the moral authority of *kyai* and teachers strengthened the effectiveness of environmental character formation because students traditionally regard religious leaders as examples of ethical conduct. As a result, ecological values were internalized not only cognitively but also emotionally and spiritually through relational interaction and moral example.

Religious values also played a central role in ecological habituation and character formation. Environmental practices were consistently associated

with Islamic teachings concerning *khalifah fil ardh* (human stewardship), *amanah* (responsibility), *thaharah* (cleanliness), and the prohibition against *fasad fil ardh* (environmental destruction). Teachers integrated environmental messages into religious learning sessions, sermons, and daily advice, enabling students to perceive environmental care as part of Islamic worship and spiritual responsibility.

One student administrator explained:

"We are taught that protecting the environment is part of our responsibility as Muslims. Cleaning the pesantren is not only about discipline, but also about worship."
(Interview with Student Administrator, April 2026)

This finding supports Islamic eco-theology perspectives that position environmental preservation as a manifestation of religious ethics and spiritual devotion²¹. The integration of environmental values with Islamic teachings strengthened students' internal motivation because ecological responsibility was interpreted as part of faith rather than merely institutional obligation.

The findings further indicate that ecological habituation gradually transformed into ecological culture within the pesantren community. Environmental values became embedded in collective norms, social interaction, and students' institutional identity. Maintaining environmental cleanliness evolved from administrative obligation into social expectation reinforced through peer culture and communal responsibility. Students increasingly perceived environmental care as part of what it means to be a santri at Pondok Pesantren Temulus.

From the perspective of character education theory, this transformation demonstrates that environmental character formation becomes more sustainable when supported by integrated institutional systems, collective culture, and value internalization. The eco-pesantren model implemented at

²¹ Seyyed Hossein Nasr, *Religion and the Order of Nature* (New York: Oxford University Press, 1996).

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Pondok Pesantren Temulus illustrates that environmental education in Islamic boarding schools can function effectively when ecological practices are integrated with habituation processes, religious values, social interaction, and exemplary leadership simultaneously. Consequently, ecological awareness develops not merely at the cognitive level but also as a deeply internalized moral and cultural disposition.

3. Transformation of Students' Environmental Care Attitudes

The findings demonstrate that the implementation of eco-pesantren management at Pondok Pesantren Temulus contributed significantly to transforming students' environmental care attitudes. The transformation was reflected not only in observable behavioral changes but also in the emergence of ecological awareness, environmental responsibility, and value internalization rooted in Islamic teachings. Environmental care gradually evolved from externally enforced discipline into an internal moral commitment embedded within students' daily consciousness and social identity.

Observational findings revealed substantial behavioral changes among students following the implementation of eco-pesantren programs. Students increasingly demonstrated disciplined environmental behavior, including disposing of waste properly, participating actively in environmental cleaning activities, conserving water and electricity, and maintaining the cleanliness of dormitories and public spaces without requiring intensive supervision. The findings suggest that repeated environmental practices and collective institutional culture contributed to the normalization of ecological responsibility within the pesantren environment.

One teacher explained:

"Previously, many students ignored environmental cleanliness. Now, most students automatically participate in maintaining cleanliness without waiting for instructions."
(Interview with Teacher, April 2026)

This finding indicates that eco-pesantren implementation successfully fostered behavioral transformation through sustained habituation and social reinforcement. From the perspective of environmental behavior theory, repeated exposure to ecological practices can gradually reshape attitudes and behavioral orientations toward environmental responsibility²². The pesantren environment functioned as a social ecosystem that consistently reinforced ecological behavior through routines, regulations, peer interaction, and institutional culture.

The transformation of students' environmental attitudes was also evident in the increasing level of environmental participation and initiative among students. Findings revealed that many students voluntarily engaged in environmental activities beyond formal obligations. Students independently maintained gardens, monitored environmental cleanliness, organized environmental campaigns, and reminded peers to practice responsible environmental behavior. Such voluntary participation demonstrates that environmental care had shifted from compliance based behavior toward internally motivated ecological commitment.

Table 4. Transformation of Students' Environmental Care Attitudes

Indicators	Before Eco-Pesantren Implementation	After Eco-Pesantren Implementation
Waste disposal behavior	Frequently littering	Proper waste disposal and sorting
Participation in cleaning activities	Passive participation	Active and voluntary participation
Environmental awareness	Limited ecological concern	Increased environmental responsibility
Water and energy usage	Wasteful consumption habits	More disciplined conservation behavior
Social responsibility	Individualistic tendencies	Collective environmental awareness

²² Anja Kollmuss and Julian Agyeman, "Mind the Gap: Why Do People Act Environmentally and What Are the Barriers to Pro-Environmental Behavior?," *Environmental Education Research* 8, no. 3 (2002): 239–60, <https://doi.org/10.1080/13504620220145401>.

The findings further reveal that environmental awareness among students was strengthened through the integration of Islamic values into ecological education. Environmental preservation was consistently associated with religious concepts such as *amanah* (trustworthiness), *khalifah fil ardh* (human stewardship), and *hifz al bi'ah* (environmental preservation). As a result, students increasingly perceived environmental responsibility as part of Islamic moral obligations rather than merely institutional regulations.

One student stated:

"We understand that protecting the environment is part of our responsibility before Allah. Throwing garbage carelessly is not only dirty, but also morally wrong."
(Interview with Student, April 2026)

This finding supports the perspective of Islamic environmental ethics, which argues that ecological responsibility in Islam is closely connected to spiritual accountability and moral consciousness²³. The integration of religious values strengthened students' intrinsic motivation because environmental care was interpreted as part of worship and ethical devotion rather than external obligation.

The transformation of students' environmental attitudes also reflects the development of ecological consciousness. Students increasingly demonstrated awareness regarding the relationship between human behavior and environmental sustainability. Interview findings indicate that students became more conscious of environmental consequences resulting from waste accumulation, excessive resource consumption, and environmental negligence. Students also expressed concern regarding broader environmental problems such as pollution, flooding, and climate change, indicating the emergence of wider ecological awareness beyond the pesantren context.

²³ Richard C Foltz, Frederick M Denny, and Azizan Baharuddin, *Islam and Ecology: A Bestowed Trust* (Cambridge, MA: Harvard University Press, 2003).

One student administrator explained:

"After joining eco-pesantren activities, we realized that environmental problems are not only local issues. Climate change and pollution affect everyone, so we must start caring from small daily actions."

(Interview with Student Administrator, April 2026)

This finding aligns with the New Ecological Paradigm perspective, which emphasizes that environmental awareness develops when individuals recognize the interdependence between humans and ecological systems²⁴. Eco-pesantren activities encouraged students to understand environmental sustainability not merely as technical cleanliness, but as part of broader ecological responsibility.

Another important finding concerns the emergence of ecological culture within the pesantren community. Environmental values gradually became embedded in collective social norms and institutional identity. Students perceived environmental care as an important characteristic of being a santri at Pondok Pesantren Temulus. Peer supervision and communal expectations strengthened ecological discipline because environmental responsibility had become socially valued within the pesantren culture.

Observational findings revealed that students often reminded peers to maintain cleanliness, save electricity, and participate in environmental activities. Such peer based reinforcement indicates that ecological values had become institutionalized within the social fabric of the pesantren. This finding supports institutional culture theory, which explains that values become sustainable when integrated into collective norms, social interaction, and organizational identity²⁵.

²⁴ Riley E Dunlap et al., "Measuring Endorsement of the New Ecological Paradigm: A Revised NEP Scale," *Journal of Social Issues* 56, no. 3 (2000): 425–42, <https://doi.org/10.1111/0022-4537.00176>.

²⁵ Edgar H Schein, *Organizational Culture and Leadership*, 4th ed. (San Francisco: Jossey-Bass, 2010).

Nevertheless, the findings also reveal several limitations in the transformation process. Not all students demonstrated the same level of environmental awareness and discipline. Some students continued displaying careless behavior regarding waste disposal and resource conservation. Differences in prior socialization, family background, and individual motivation influenced the varying levels of responsiveness toward eco-pesantren programs. Furthermore, the continuous annual influx of new students created challenges for maintaining environmental culture consistency because each new cohort required adaptation and resocialization processes.

Despite these challenges, the overall findings indicate that eco-pesantren management contributed substantially to developing students' environmental care attitudes and ecological consciousness. The integration of environmental management, Islamic values, habituation processes, and collective culture enabled environmental education to function more effectively and sustainably within the pesantren context. Environmental responsibility became internalized not only as behavioral discipline but also as moral awareness, spiritual commitment, and collective institutional identity.

From a theoretical perspective, the findings demonstrate that environmental attitude transformation becomes more effective when educational institutions integrate cognitive learning, moral values, social practices, and cultural systems simultaneously. The eco-pesantren model illustrates that ecological education in Islamic boarding schools can produce sustainable behavioral change when supported by participatory management, religious value internalization, collective habituation, and exemplary leadership. Therefore, eco-pesantren represents not merely an environmental program but a transformative educational model capable of strengthening ecological citizenship and sustainable character formation among students.

4. Sustainability, Challenges, and Future Pathways for Eco-Pesantren Development

The findings reveal that although the implementation of eco-pesantren at Pondok Pesantren Temulus demonstrated significant positive impacts on students' environmental awareness and ecological culture formation, the sustainability of the program continues to face several institutional and cultural challenges. Eco-pesantren sustainability depends not only on environmental activities themselves, but also on the consistency of institutional commitment, leadership continuity, students' participation, and the integration of environmental values into pesantren culture. This finding indicates that environmental education within Islamic boarding schools must be understood as a long term transformative process rather than a short term administrative program.

One of the major challenges identified in this study concerns the diversity of students' environmental awareness and behavioral backgrounds. Students entering the pesantren originated from different social, educational, and cultural environments, resulting in varying levels of ecological understanding and environmental discipline. Some newly enrolled students initially demonstrated low awareness regarding cleanliness, waste management, and environmental responsibility. Consequently, pesantren administrators were required to continuously repeat socialization and habituation processes for each new cohort of students.

One eco-pesantren coordinator explained:

"Every year new students come with different habits and environmental awareness. Some students adapt quickly, while others need continuous guidance and supervision."

(Interview with Eco-Pesantren Coordinator, April 2026)

This finding reflects the challenges of institutional culture regeneration within educational organizations. According to Schein , organizational culture

requires continuous reinforcement because values cannot be sustained automatically without repeated socialization and institutional practice²⁶. In the context of eco-pesantren, environmental culture must therefore be consistently reproduced through educational interaction, daily habituation, and collective supervision.

Another challenge concerns infrastructure and institutional resources. Although the pesantren had developed basic environmental management systems such as waste sorting facilities, sanitation schedules, and greening programs, several infrastructural limitations remained evident. Waste management facilities were still relatively simple, recycling systems remained limited, and environmental technology utilization such as renewable energy systems had not yet been implemented optimally. Financial limitations also constrained the pesantren's ability to expand environmental infrastructure and improve environmental management efficiency.

Table 5. Challenges in Eco-Pesantren Implementation

Challenges	Description	Implications
Diverse student backgrounds	Different environmental awareness levels among students	Uneven ecological discipline
Annual student regeneration	Continuous adaptation of new students	Repeated socialization required
Limited infrastructure	Simple waste management and conservation facilities	Reduced environmental efficiency
Human resource limitations	Multiple responsibilities of teachers and administrators	Limited supervision effectiveness
Behavioral inconsistency	Some students remain environmentally undisciplined	Difficulty maintaining ecological culture

The findings also indicate that human resource limitations affected program sustainability. Teachers and pesantren administrators were responsible not only for environmental programs but also for broader

²⁶ Schein.

educational and administrative duties. As a result, supervision and evaluation of environmental activities could not always be conducted optimally across all pesantren areas. This finding demonstrates that sustainable environmental management requires institutional support systems capable of distributing responsibilities effectively among organizational members.

Despite these challenges, several strategic factors contributed significantly to sustaining eco-pesantren implementation. One of the strongest sustainability factors was the integration of Islamic religious values into environmental education. Students perceived environmental responsibility as part of spiritual devotion, moral obligation, and Islamic identity. This religious reinforcement strengthened students' internal motivation because ecological behavior was associated with faith, worship, and ethical accountability before God.

One teacher stated:

*"Environmental programs become easier to sustain because students believe that protecting nature is part of Islamic teaching and religious responsibility."
(Interview with Teacher, April 2026)*

This finding supports the perspective of Islamic environmental ethics, which emphasizes that environmental stewardship becomes more sustainable when ecological responsibility is integrated with spiritual values and moral consciousness²⁷. Religious values therefore functioned not only as normative foundations but also as motivational resources that strengthened students' long term environmental commitment.

Another important sustainability strategy involved participatory leadership and collective responsibility. Students were actively involved in environmental decision making, supervision, and program implementation.

²⁷ Foltz, Denny, and Baharuddin, *Islam and Ecology: A Bestowed Trust*.

ILJ: Islamic Learning Journal (Jurnal Pendidikan Islam)

E-ISSN: 2985-6094. DOI: <https://doi.org/10.54437/ilj>

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Such participatory involvement strengthened students' sense of ownership toward eco-pesantren programs and reduced dependence on top down institutional control. This finding aligns with transformative leadership theory, which emphasizes empowerment, collaboration, and collective engagement as essential components of sustainable institutional transformation²⁸.

Observational findings further revealed that exemplary leadership (*uswah hasanah*) significantly strengthened environmental sustainability within the pesantren. Kyai, teachers, and student leaders consistently demonstrated environmental discipline through direct participation in cleaning activities, greening programs, and environmental campaigns. Such role modeling created moral legitimacy and social influence that encouraged students to internalize ecological behavior more effectively.

Table 6. Sustainability Strategies and Institutional Impact

Sustainability Strategies	Implementation Practices	Institutional Impact
Religious value integration	Linking ecology with Islamic teachings	Stronger intrinsic motivation
Participatory leadership	Student involvement in environmental governance	Increased ownership and responsibility
Ecological habituation	Continuous daily environmental practices	Sustainable behavioral change
Exemplary leadership	Direct involvement of leaders and teachers	Stronger moral legitimacy
Collective culture	Peer supervision and communal responsibility	Institutionalized ecological norms

From a theoretical perspective, this study contributes to the development of Islamic educational management discourse by demonstrating that eco-pesantren functions as a holistic environmental governance model integrating institutional management, ecological

²⁸ Carolyn M Shields, "Transformative Leadership: Working for Equity in Diverse Contexts," *Educational Administration Quarterly* 46, no. 4 (2010): 558–89, <https://doi.org/10.1177/0013161X10375609>.

education, religious values, and character formation simultaneously. Unlike secular environmental education approaches that often emphasize technical ecological knowledge, the eco-pesantren model integrates spiritual consciousness, moral responsibility, and collective culture into environmental learning processes.

The findings also strengthen the discourse of Islamic eco-theology by demonstrating that Islamic teachings concerning *khalifah fil ardh*, *amanah*, and *hifz al bi'ah* can function effectively as practical educational foundations for ecological sustainability. Environmental awareness among students developed not merely through cognitive instruction, but through value internalization embedded within social interaction, institutional culture, and religious practice. Therefore, eco-pesantren represents a transformative educational approach capable of connecting Islamic spirituality with contemporary environmental challenges.

Practically, the findings suggest that pesantren administrators should integrate environmental sustainability into institutional governance rather than positioning environmental programs as supplementary activities. Environmental education should be incorporated systematically into curriculum development, dormitory management, organizational culture, and leadership practices. External collaboration with government institutions, universities, environmental organizations, and civil society groups could further strengthen infrastructure development, environmental literacy, and program sustainability.

Nevertheless, this research has several limitations. First, the study employed a single case study approach focused only on Pondok Pesantren Temulus, limiting broader generalization across diverse pesantren contexts. Second, the duration of field research was relatively limited, covering one month of intensive observation and interviews. Third, the study primarily

explored environmental attitudes and institutional culture qualitatively without measuring long term behavioral outcomes quantitatively.

Therefore, future research should explore comparative eco-pesantren implementation across different regions and institutional models to develop broader understanding regarding environmental governance in Islamic educational institutions. Longitudinal studies examining the sustainability of students' ecological attitudes after leaving pesantren environments would also provide important insights regarding the long term effectiveness of eco-pesantren education. Additionally, mixed methods research combining qualitative and quantitative approaches could strengthen empirical understanding regarding the relationship between eco-pesantren management and environmental behavior transformation among students.

Ultimately, the findings indicate that eco-pesantren possesses substantial potential to function as a faith based environmental education model capable of supporting sustainable development, ecological citizenship, and Islamic character education simultaneously. The integration of environmental sustainability with Islamic values enables pesantren to contribute strategically toward addressing contemporary environmental challenges while maintaining their traditional educational identity.

Conclusion

This study demonstrates that eco-pesantren management at Pondok Pesantren Temulus functions not merely as an environmental conservation program, but as an integrated Islamic educational management system that systematically combines environmental governance, character education, religious values, and ecological habituation within students' daily lives. The implementation of eco-pesantren management through planning, organizing, implementation, and supervision contributed significantly to the formation of students' environmental care attitudes and ecological culture. Environmental responsibility among students developed not only at the behavioral level, but also

as moral awareness and spiritual commitment grounded in Islamic teachings concerning *khalifah fil ardh*, *amanah*, and *hifz al bi'ah*. The findings indicate that the integration of Islamic values into environmental education strengthens students' intrinsic motivation and supports the sustainability of ecological behavior within the pesantren environment.

The study further reveals that the effectiveness of eco-pesantren depends on the interaction between institutional management, participatory leadership, collective culture, religious reinforcement, and habituation processes. Eco-pesantren activities became sustainable because environmental values were internalized through continuous daily practice, exemplary leadership, and communal responsibility rather than through formal regulations alone. In this regard, eco-pesantren represents a transformative educational model capable of integrating Islamic spirituality with environmental sustainability and ecological citizenship. Theoretically, this research contributes to the development of Islamic educational management discourse by positioning eco-pesantren as a holistic environmental governance model within Islamic educational institutions. Practically, the findings provide strategic insights for pesantren administrators and Islamic educational leaders regarding the importance of integrating environmental sustainability into institutional governance, curriculum development, and character education systems.

Nevertheless, this research has several limitations. The study focused on a single pesantren context and employed a qualitative case study approach with a relatively limited research duration. Therefore, the findings cannot be generalized broadly across all pesantren contexts. Future research is recommended to conduct comparative studies across different eco-pesantren models and regions, as well as longitudinal studies examining the long term sustainability of students' ecological attitudes and behaviors after leaving the pesantren environment. Quantitative and mixed methods approaches may also

strengthen empirical understanding regarding the relationship between eco-pesantren management and environmental behavior transformation. Despite these limitations, this study confirms that eco-pesantren possesses substantial potential to become an alternative model of faith based environmental education capable of supporting sustainable development while strengthening Islamic character formation in contemporary society.

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