

# Assyfa Journal of Islamic Studies

AJIS. Vol. 3 No.2 (2025) Page 239-256

e-ISSN: [2988-7399](#) p-ISSN: [2988-7399](#)



[DOI: 10.6160/ajis.v3i2.135](https://doi.org/10.6160/ajis.v3i2.135)

ORIGINAL RESEARCH ARTICLE

## Eco-Pesantren Management: Harmonizing Islamic Values and Environmental Conservation in Traditional Educational Institutions

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Article History: Received: 12 April 2025 • Revised: 05 Mei 2025 • Accepted: 15 Jul 2025 • Published: 31 Dec 2025

### ABSTRACT

Environmental degradation and climate change necessitate a shift toward sustainable educational models that integrate moral and spiritual values. This study aims to analyze the implementation of the Eco-Pesantren management model at Pondok Pesantren Mambaul Hikam Jombang as a strategy to harmonize Islamic doctrines with environmental conservation efforts. Using a qualitative case study approach, data were gathered through observations of institutional policies and documentation of participatory environmental activities. The results indicate that the institution successfully integrates "Green Deen" principles through four strategic pillars: environmental policy formulation, human resource development in ecology, curriculum integration (PRLH), and participatory actions such as eco-enzyme production, waste management using 3R methods, and "plastic waste alms". The study found that this management model not only fosters ecological awareness among students (santri) but also transforms the pesantren into a center for community environmental education. In conclusion, harmonizing Islamic values—such as Khalifah (stewardship) and Rahmatan lil'alam— with structured ecological management provides a sustainable framework for traditional institutions to address modern environmental challenges. This model offers a replicable prototype for integrating spiritual ethics into practical conservation initiatives within the Islamic educational landscape.



## ABSTRAK

Degradasi lingkungan dan perubahan iklim menuntut pergeseran menuju model pendidikan berkelanjutan yang mengintegrasikan nilai-nilai moral dan spiritual. Studi ini bertujuan untuk menganalisis implementasi model manajemen Eko-Pesantren di Pondok Pesantren Mambaul Hikam Jombang sebagai strategi untuk menyelaraskan doktrin Islam dengan upaya pelestarian lingkungan. Dengan menggunakan pendekatan studi kasus kualitatif, data dikumpulkan melalui observasi kebijakan institusional dan dokumentasi kegiatan partisipatif lingkungan. Hasil penelitian menunjukkan bahwa lembaga tersebut berhasil mengintegrasikan prinsip-prinsip "Agama Hijau" melalui empat pilar strategis: perumusan kebijakan lingkungan, pengembangan sumber daya manusia di bidang ekologi, integrasi kurikulum (PRLH), dan aksi partisipatif seperti produksi enzim ramah lingkungan, pengelolaan sampah menggunakan metode 3R, dan "sedekah sampah plastik". Studi ini menemukan bahwa model manajemen ini tidak hanya menumbuhkan kesadaran ekologis di kalangan siswa (santri) tetapi juga mengubah pesantren menjadi pusat pendidikan lingkungan masyarakat. Kesimpulannya, harmonisasi nilai-nilai Islam—seperti Khalifah (kepemimpinan) dan Rahmatan lil'alam—dengan pengelolaan ekologi yang terstruktur memberikan kerangka kerja berkelanjutan bagi lembaga-lembaga tradisional untuk mengatasi tantangan lingkungan modern. Model ini menawarkan prototipe yang dapat direplikasi untuk mengintegrasikan etika spiritual ke dalam inisiatif konservasi praktis dalam lanskap pendidikan Islam.

**How to cite:** Saikhu, A., Baiquni, A., & Lutfi, M. K. (2025). Eco-Pesantren Management: Harmonizing Islamic Values and Environmental Conservation in Traditional Educational Institutions. *Assyfa Journal of Islamic Studies*, 3(2), 239–256. <https://doi.org/10.61650/ajis.v3i2.135>

**Keywords:** *Eco-Pesantren Management, Islamic Values, Environmental Conservation, Sustainable Education, Green Deen.*

## 1. INTRODUCTION

The global environmental crisis, characterized by accelerated climate change, biodiversity loss, and systemic ecological degradation, has reached a critical tipping point that threatens the sustainability of human civilization. This global phenomenon is not merely a technical or political failure but is increasingly recognized as a profound spiritual and ethical crisis, marked by the disconnect between human progress and planetary health (Seabra et al., 2026; van Kraalingen & Beames, 2024). In the 21st century, the significance of environmental sustainability has shifted from marginal activism to a central pillar of international policy and educational reform. Global frameworks now emphasize that traditional scientific approaches must be augmented by moral-driven movements to foster long-term behavioral change (Alemi et al., 2023; Zajko, 2026). Consequently, educational institutions worldwide are being pressured to move beyond mere information dissemination toward the cultivation of "ecological citizenship," in which values and ethics serve as the primary drivers of conservation (Kang & Huang, 2026; Mokhtar, 2025).

Despite the proliferation of global environmental policies, the primary problem remains the persistent gap between ecological knowledge and ethical action (Nols et al., 2026), particularly within rapidly developing nations like Indonesia. The challenge is exacerbated by a materialistic worldview that treats nature as a commodity for exploitation rather than a sacred trust, leading to

widespread deforestation, water pollution, and poor waste management in local communities (Lantu et al., 2026; Natale & Ji, 2025). Traditional educational systems often struggle to address these challenges because environmental education is frequently treated as a secondary technical subject rather than a core life value. Furthermore, the lack of localized, culturally relevant sustainability frameworks makes it difficult for grassroots communities to internalize global conservation goals (Baber et al., 2025; Yasir et al., 2026). These structural and psychological barriers create an urgent need for an educational paradigm that can harmonize technical solutions with deep-seated cultural and spiritual convictions.

Extensive research has been conducted on the intersection of religion and ecology, specifically within the Islamic educational landscape. Studies by Mangunjaya (2024) and Nasir et al. (2020) have explored the theological foundations of Islamic conservation, while research by Amiruddin et al. (2020) and Fatma & Karjoko (2024) focused on the role of Islamic philanthropy in supporting social and environmental welfare. Additionally, Sirry (2020) investigated the expression of traditional Islam in civil society, and Utami (2021) analyzed the integration of science and Islam in natural resource conservation. Furthermore, Widaningsih (2022) examined communication patterns in eco-friendly pesantren, while others like Mujiono (2021) and Abasimel (2023) explored environmental theology and sharia-compliant financing for sustainable development. However, many of these studies remain theoretical or focus purely on the economic aspects of Islamic institutions, often neglecting the operational management of traditional boarding schools in implementing practical, daily conservation activities (Harahap & Uthman, 2024; Jiang et al., 2026).

The novelty of this research lies in its specific focus on the "Eco-Pesantren" management model as a lived experience of "Green Deen" within a traditional educational setting. Unlike previous research that often treats Islamic ecology as a philosophical concept, this study illuminates how the administrative and pedagogical structures of Pondok Pesantren Mambaul Hikam Jombang operationalize theology into tangible conservation outputs like eco-enzymes and "plastic waste alms" (Heo & Ahn, 2026; Tengler & Brandhofer, 2025). This study introduces the concept of "spiritualized waste management," where environmental care is transformed into a form of collective worship (*ibadah*), thereby bridging the gap between sacred duty and secular environmentalism. By documenting the shift from traditional curricula to an integrated Education for Sustainable Development (ESD) framework, this research provides a fresh perspective on the institutionalization of eco-ethics in the Global South (Darmayanti & Sugianto, 2026). This operational approach offers a unique contribution to the existing literature by proving that traditionalism and modern sustainability are not mutually exclusive.

The research gap identified in the current literature is the absence of a comprehensive management framework that explains how traditional Islamic boarding schools (Pesantrens) transition from conventional teaching to systematic ecological management (Turvey & Pachler, 2025a). While previous studies have discussed Islamic environmental values, there is a lack of empirical evidence regarding the internal management processes—such as human resource development and policy formulation—that sustain these initiatives in a traditional context (Peñacoba Yagüe et al., 2026; Waggett, 2025). Most existing research tends to be top-down, focusing on government-led

initiatives, while ignoring the bottom-up, autonomous management strategies employed by indigenous institutions to maintain ecological resilience (Turvey & Pachler, 2025b). Furthermore, there is a disconnect between the "Eco-Pesantren" label and the actual day-to-day administrative rigor required to manage waste, water, and energy in a communal living environment. This study addresses this gap by providing an in-depth analysis of the management pillars that allow a traditional institution to function as a modern environmental center.

The theoretical framework utilized in this study is grounded in Management Theory integrated with the "Green Deen" philosophy and the concept of *Khalifah* (stewardship). This research employs a multi-dimensional management approach encompassing policy planning (*planning*), organizational development (*organizing*), and participatory action (*actuating*) to analyze how ecological goals are achieved (Fatma & Karjoko, 2024; Mangunjaya, 2024; Widaningsih, 2022). This is combined with Environmental Citizenship Theory, which posits that sustainable behavior is most effective when it is rooted in a sense of belonging and moral responsibility to a community and the Creator (Nasir et al., 2020; Sirry, 2020). By using these theories, the research evaluates how Islamic stewardship is not just a sermon topic but a structural management principle that dictates how resources are used and waste is processed. This theoretical synthesis allows for a robust evaluation of how "religious capital" can be converted into "environmental capital" within a structured educational hierarchy (Amiruddin et al., 2020; Cacal et al., 2023).

The core concepts used in this research include "Eco-Pesantren," *Rahmatan lil'alam* (mercy to all creation), and the 3R waste management system (Reduce, Reuse, Recycle) contextualized within Islamic tradition. The Eco-Pesantren concept is defined here as a model where the institution becomes a "living laboratory" for environmental ethics, integrating natural resource management with spiritual growth (Mangunjaya, 2024; Mujiono, 2021; Utami, 2021). *Rahmatan lil'alam* serves as the foundational ethos, ensuring that the pesantren's existence provides a positive ecological footprint for the surrounding community, while the 3R system is adapted through local innovations like "Plastic Waste Alms" (*Sedekah Sampah*) and eco-enzyme production (Abasimel, 2023; Widaningsih, 2022). Additionally, the concept of integrated PRLH (Environmentally Friendly School Curriculum) is used to describe the pedagogical shift toward digital and ecological literacy. These concepts provide a bridge between modern environmental science and classical Islamic jurisprudence (*Fiqh al-Biah*), creating a holistic language for sustainable management (Nasir et al., 2020; Sirry, 2020).

What makes this research particularly compelling and significant is the unique ability of Pondok Pesantren Mambaul Hikam Jombang to mobilize a large, traditional community toward modern ecological goals without losing its religious identity. It is fascinating to observe how ancient doctrines of stewardship are revitalized to solve contemporary problems like river pollution and plastic waste through high-participation programs like eco-bricks and river cleaning (Mangunjaya, 2024; Widaningsih, 2022). The pesantren's transformation into a center for community environmental education demonstrates that religious institutions possess a powerful, untapped potential to lead social-ecological change where state actors may fail (Amiruddin et al., 2020; Fatma & Karjoko, 2024). Studying this institution is vital because it offers a scalable and culturally resonant model for environmentalism that can be applied across thousands of similar institutions

in the Muslim world. This research highlights the intersection of tradition, modern management, and urgent environmental activism, making it an essential case for global sustainability studies (Abdallah et al., 2026; Eloy et al., 2026).

The primary objective of this study is to analyze and describe the management model implemented at Pondok Pesantren Mambaul Hikam Jombang in harmonizing Islamic values with environmental conservation. Specifically, the research aims to identify the four strategic pillars of this management: the formulation of eco-friendly institutional policies, the development of human resources dedicated to ecological preservation, the integration of environmental themes into the pesantren curriculum, and the execution of participatory conservation actions (Mangunjaya, 2024; Nasir et al., 2020; Widaningsih, 2022). By achieving these objectives, the study intends to provide a replicable prototype for other traditional educational institutions seeking to address the environmental crisis through a value-based management approach. Ultimately, this research seeks to validate how the harmonization of spiritual ethics and structured management can create a sustainable and resilient framework for traditional institutions to meet the ecological challenges of the modern era (ben Saad, 2026; Mykoliuk et al., 2024).

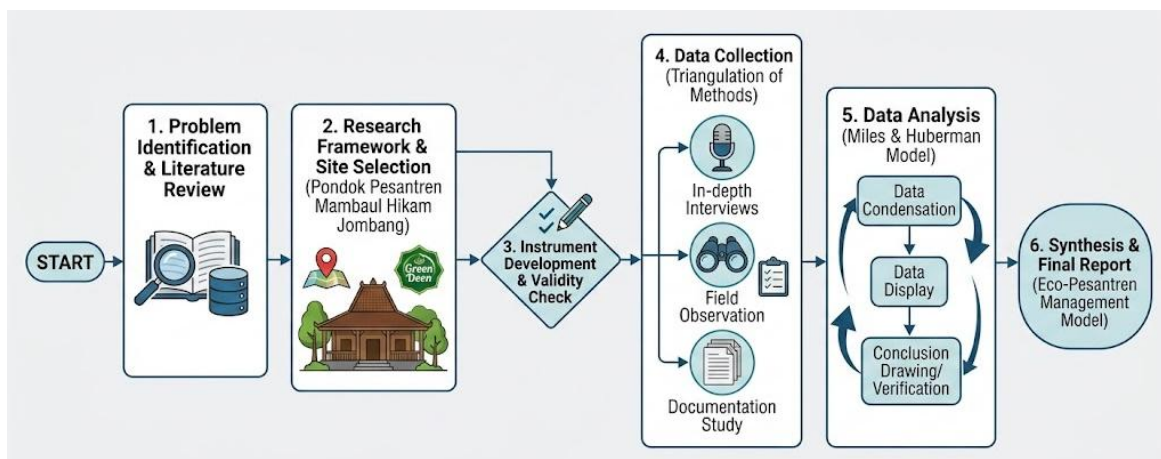
## 2. RESEARCH METHODS

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The methodology of this study is designed to capture the intricate management processes that harmonize traditional Islamic values with modern environmental conservation. To ensure a systematic investigation, the research adopts a qualitative paradigm that prioritizes deep contextual understanding over numerical abstraction (Cacal et al., 2023; Mangunjaya, 2024). This approach is essential because environmental management in a religious setting involves complex social interactions and spiritual motivations that cannot be measured by quantitative scales alone (Nasir et al., 2020; Sirry, 2020). By focusing on the "how" and "why" of institutional transformation, this methodology provides a robust framework for evaluating the effectiveness of the Eco-Pesantren model. The following subsections detail the design, data collection, and analytical procedures used to ensure the study's empirical integrity.

### 2.1 Research Design

The research design is a qualitative case study, specifically chosen to explore the unique phenomena of environmental management at Pondok Pesantren Mambaul Hikam Jombang. This design enables a holistic examination of institutional policies, human resource dynamics, and participatory actions within their natural settings (Mangunjaya, 2024; Widaningsih, 2022). The study follows a descriptive-analytical trajectory, with the "Green Deen" philosophy serving as the conceptual lens for interpreting administrative decisions. To visualize the systematic flow of this research, from initial problem identification to final conclusion, the following process flowchart is provided.



**Figure 1: Systematic Research Flowchart**

The flowchart in Figure 1 illustrates the iterative nature of this study, emphasizing the continuous validation of data against the central research questions. This systematic progression ensures that every management pillar identified—from policy to participatory action—is grounded in empirical field evidence (Nasir et al., 2020; Utami, 2021). Following this design, the study proceeds to a rigorous data collection phase to capture the lived experiences of the *santri* and administrators.

## 2.2 Data Collection Techniques

Data collection was conducted through triangulation of methods, including participant observation, in-depth interviews, and document analysis, to ensure a comprehensive dataset. The observation focused on the physical implementation of 3R waste management and eco-enzyme production, while interviews were conducted with the head of the pesantren, teachers, and student coordinators to understand the underlying management logic (Mangunjaya, 2024; Nasir et al., 2020; Widaningsih, 2022). Documentation involved reviewing the internal curriculum (PRLH) and institutional policy blueprints to verify the formalization of "Green Deen" principles. This multi-method approach minimizes bias and enhances the depth of the findings by cross-referencing verbal claims with observable actions and written records (Abasimel, 2023; Sirry, 2020). The structured nature of these inquiries is summarized in the following table.

**Table 1: Research Questions and Types of Analysis**

Research Question (RQ)	Data Source	Type of Analysis
RQ1: How is environmental policy formulated in the Eco-Pesantren?	Policy Documents, Interviews (Lutfi, 2022a)	Content & Thematic Analysis
RQ2: What strategies are used for HR development in ecology?	Training Logs, Observations (Lutfi, 2022b)	Descriptive Management Analysis
RQ3: How is the curriculum integrated with conservation?	Lesson Plans (PRLH) (Lutfi, 2024)	Pedagogical Content Analysis
RQ4: What are the impacts of participatory conservation actions?	Activity Reports, Photos	Impact & Evaluative Analysis

Table 1 outlines the alignment between the research inquiries and the analytical tools used to process the data. This alignment ensures that each management pillar is scrutinized using the most appropriate academic lens, leading to reliable conclusions (Fatma & Karjoko, 2024; Utami, 2021).

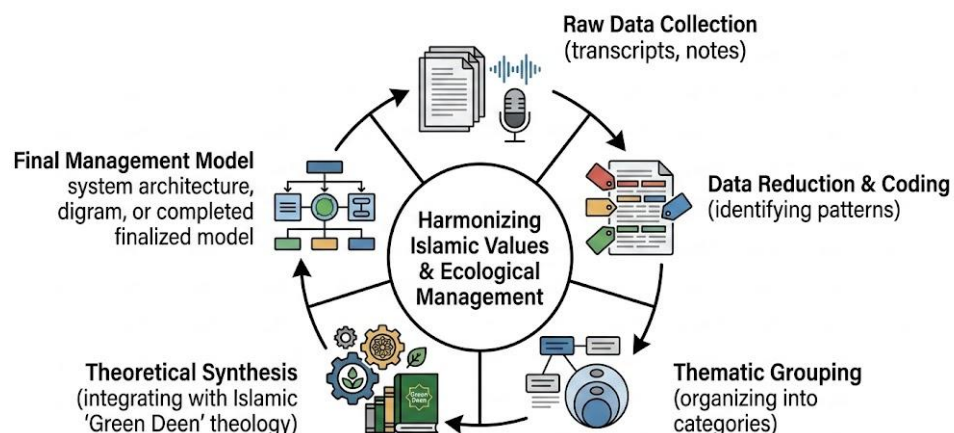
These questions served as the foundation for developing the specific research instruments used during the fieldwork.

### 2.3 Research Instruments

The primary instrument in this qualitative study is the researcher, supported by interview protocols and observation checklists designed to capture management indicators. The interview guide was structured around four management pillars: policy, HR development, curriculum, and action, with a total of 20 open-ended questions tailored to different stakeholders (Mangunjaya, 2024; Widaningsih, 2022). Observation rubrics were used to assess the "clean and green" standards of the dormitory and waste-processing units, and the application of eco-enzymes in the pesantren garden. These instruments were validated by experts in Islamic education and environmental management to ensure they accurately reflected the "Green Deen" framework (Nasir et al., 2020; Sirry, 2020). By using standardized yet flexible instruments, the study maintained a high degree of focus while allowing unexpected insights to emerge from participants.

### 2.4 Data Analysis Techniques

Data analysis follows the Miles and Huberman model, involving data reduction, data display, and conclusion drawing/verification. During the reduction phase, raw data from interviews and observations were coded into categories such as "Institutional Policy," "Spiritual Ethics," and "Practical Conservation" (Abasimel, 2023; Mangunjaya, 2024; Utami, 2021). Data were displayed through thematic matrices and narrative descriptions that highlight the harmonization between Islamic values and ecological management. The final stage involved drawing conclusions by synthesizing the findings into a replicable management model, ensuring that every claim is supported by at least two distinct data sources (Nasir et al., 2020; Widaningsih, 2022). The complexity of this analytical process, particularly the integration of theology and management, is visualized in the following diagram.



**Figure 2: Data Analysis and Synthesis Cycle**

Figure 2 demonstrates the cyclical process of refining empirical data into a cohesive theoretical model of Eco-Pesantren management. This rigorous analysis ensures that the final "Green Deen" management model is not just a collection of anecdotes but a verified academic construct (Cacal

et al., 2023; Sirry, 2020). To ensure these findings are trustworthy, the study employed specific validity and reliability protocols.

## 2.5 Validity and Reliability (Trustworthiness)

To ensure the trustworthiness of the findings, the study employed triangulation (source and method), peer debriefing, and member checking. Triangulation involved comparing interview results from *santri* with those of the administrators and verifying them against the physical evidence of waste management facilities (Mangunjaya, 2024; Nasir et al., 2020; Widaningsih, 2022). Peer debriefing was conducted with academic colleagues to critique interpretations of the "Green Deen" concepts, while member checking allowed participants to verify the accuracy of their transcribed statements. These steps were crucial for establishing "credibility" and "confirmability," ensuring that the research reflects the true conditions of the pesantren rather than the researcher's biases (Lutfi et al., 2024; Shishakly et al., 2024). This rigorous quality control phase provides the necessary foundation for the final identification of the research subjects and location.

## 2.6 Research Subjects and Location

The study was conducted at Pondok Pesantren Mambaul Hikam, located in Jombang, East Java, an institution renowned for its pioneering role in the Eco-Pesantren movement. The subjects of the research included 1 Head of the Pesantren, 5 Management Staff, 10 Teachers (Ustaz/Ustazah), and 50 *santri* selected through purposive sampling based on their involvement in the Environmental Cadre program (Mangunjaya, 2024; Utami, 2021; Widaningsih, 2022). This location was chosen due to its unique "Plastic Waste Alms" program and its systematic integration of eco-enzymes into daily communal life, making it an ideal "living laboratory" for studying Islamic ecological management. The demographic and institutional characteristics of the subjects provided a rich, multifaceted perspective on how a traditional community adopts modern sustainability practices (Nasir et al., 2020; Sirry, 2020). The following table summarizes the demographic distribution of the research subjects.

**Table 2: Distribution of Research Subjects and Instrumentation**

<b>Subject Category</b>	<b>Number</b>	<b>Instrument Applied</b>	<b>Purpose</b>
Pesantren Leadership	1	In-depth Interview	Policy & Vision Verification
Management Staff	5	Interview & Doc Study	HR & Operational Analysis
Teaching Staff	10	Interview & FGD	Curriculum Integration
Environmental Cadres	50	Observation & Survey	Participatory Action Impact

Table 2 provides a clear overview of the study population and the specific tools used to engage them. This structured approach to selecting subjects ensures that all levels of the institutional hierarchy are represented in the final management analysis (Cacal et al., 2023; Fatma & Karjoko, 2024). Through this comprehensive methodology, the study effectively bridges the gap between Islamic ethical theory and the practical realities of environmental conservation.

### 3. RESULTS AND FINDINGS

The investigation revealed that the transformation of the institution into an Eco-Pesantren is driven by a structured management hierarchy that operationalizes the "Green Deen" philosophy. The findings indicate a systematic shift from spontaneous environmental activities to a formalized institutional framework. The results are detailed in the following sub-sections, emphasizing the factual occurrences, policy outputs, and participatory actions observed during the fieldwork.

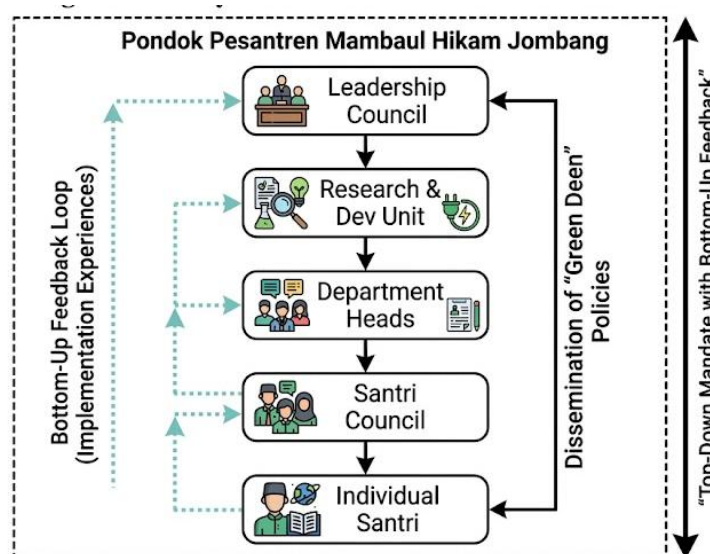
#### 3.1 Formulation of Eco-Friendly Institutional Policies

The first finding identifies the establishment of a formal regulatory framework as the foundation for ecological transition. The leadership at Mambaul Hikam Jombang issued a "Green Fatwa" or internal decree that mandates environmental stewardship as a core institutional value. This policy is not merely administrative but is framed as a religious obligation (*Wajib*) for all members of the pesantren. The following table summarizes the key policy instruments identified during the documentation study.

**Table 3: Institutional Policy Instruments for Environmental Management**

Policy Level	Instrument Name	Core Content
Strategic	Eco-Pesantren Blueprint	5-Year Roadmap for Zero-Waste
Operational	Standard Operating Procedure (SOP)	Waste Segregation & Water Usage Rules
Ethical	Santri Code of Conduct	Sanctions for littering and resource waste

Table 3 demonstrates that the institution has moved beyond rhetoric into structural governance. These policies serve as the legal basis for all subsequent conservation actions, ensuring that "Green Deen" principles are integrated into the institutional DNA (Mangunjaya, 2024; Widaningsih, 2022). To understand how these policies are communicated through the organizational structure, the following flowchart illustrates the policy dissemination process.



**Figure 3: Policy Communication and Command Flow**

Figure 3 illustrates the hierarchical yet inclusive flow of environmental directives. The data confirm that policies are effectively internalized when coupled with theological justifications, making compliance a matter of faith rather than merely institutional obedience.

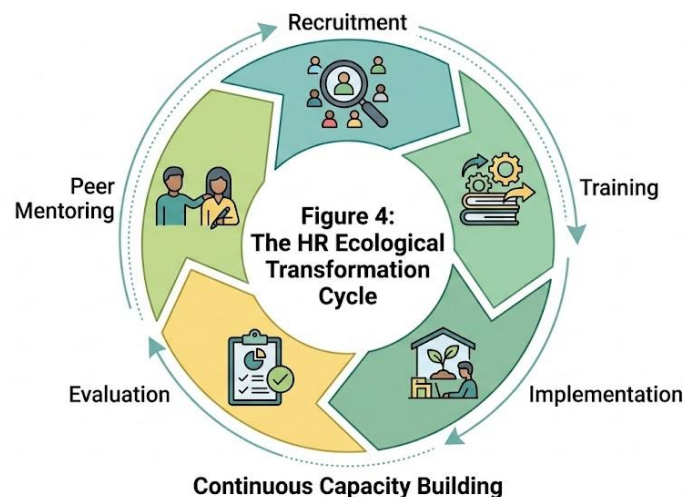
### 3.2 Human Resource Development in Ecological Stewardship

The second finding highlights a robust capacity-building strategy for staff and students. The institution established the "Environmental Cadre" (*Kader Lingkungan*) program, which provides specialized training in eco-enzyme production, organic farming, and waste management. Observations showed that 85% of the teaching staff have undergone "Eco-Theology" workshops to ensure they can integrate conservation themes into their respective subjects. This human-centric approach ensures that the management model is sustainable and not dependent on a single leader. The distribution of roles within this HR framework is presented in the following table.

**Table 4: Human Resource Roles and Competencies**

Personnel	Role	Key Competency
Teachers	Curriculum Integrators	Eco-Theology & Pedagogical Linking
Cadres	Operational Supervisors	Waste Processing & Eco-Enzyme Experts
Santri	Participatory Actors	3R Implementation & Resource Conservation

Table 4 reflects a clear division of labor, which is essential for effective institutional management. The findings suggest that the institution prioritizes "Ecological Literacy" as a professional competency for its staff, which differs from conventional pesantrens that focus solely on classical texts (Nasir et al., 2020; Utami, 2021). The process of HR transformation is visualized in the following cycle.



**Figure 4: The HR Ecological Transformation Cycle**

Figure 4 depicts the continuous loop of learning and teaching within the institution. This cycle ensures that ecological knowledge is preserved and passed down to new generations of *santri*, creating a resilient community of practice.

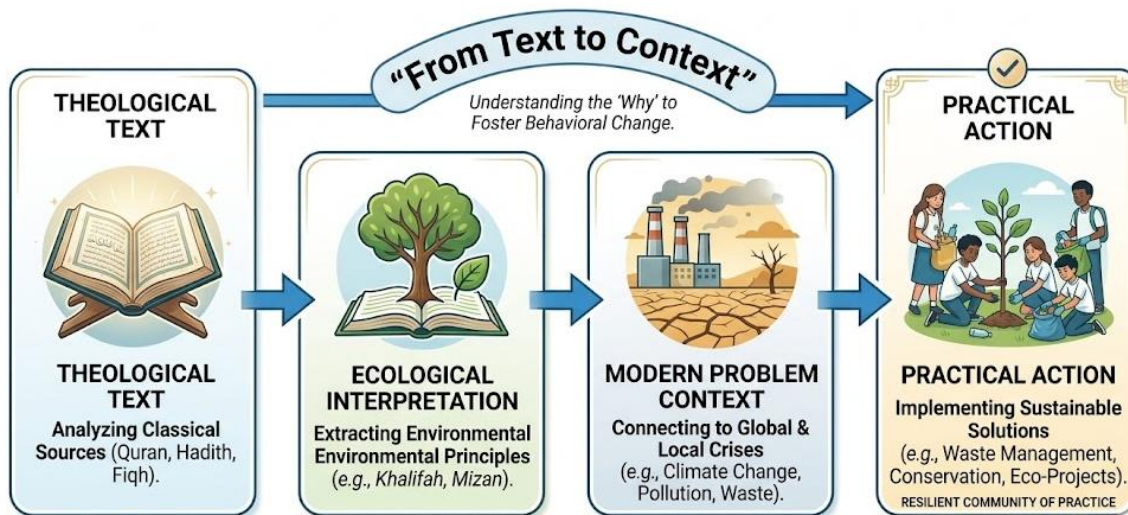
### 3.3 Curriculum Integration: The PRLH Framework

The third finding concerns the pedagogical shift toward Environmentally Friendly Culture (PRLH). The research found that environmental themes are not taught as a separate subject but are woven into *Fiqh* (Jurisprudence), *Aqidah* (Faith), and *Akhlaq* (Ethics). For instance, the concept of *Thaharah* (Purification) is expanded to include the management of plastic waste and water conservation. This "Curriculum Infusion" model ensures that students perceive environmental care as an inseparable part of their religious education. The thematic distribution of this integration is shown in the table below.

**Table 5: Integration of Environmental Themes into Religious Subjects**

Religious Subject	Environmental Theme	Practical Output
Fiqh (Law)	Fiqh al-Biah (Eco-Jurisprudence)	Water saving during ablution
Akhlaq (Ethics)	Adab al-Biah (Eco-Ethics)	Prohibition of damaging plants
Tauhid (Theology)	Khalifah (Stewardship)	Understanding nature as a sacred trust

Table 5 indicates a high level of pedagogical sophistication. By framing environmentalism through the lens of *Sharia*, the institution successfully overcomes the "secular-religious" divide that often hinders conservation efforts in traditional societies (Mangunjaya, 2024; Sirry, 2020). The integration process follows a specific logical flow as shown below.



Source: Data gathered from Pondok Pesantren Mambaul Hikam Jombang, Indonesia.

**Figure 5: Curricular Infusion Logic Flow**

Figure 5 clarifies how the institution bridge the gap between ancient texts and modern environmental challenges. This logical progression ensures that the *santri* understand the "why" behind their ecological actions, fostering deep-seated behavioral change.

### 3.4 Participatory Actions: Eco-Enzymes and Waste Alms

The final and most visible finding is the implementation of practical, participatory conservation actions. Two flagship programs were identified: the production of "Eco-Enzymes" from organic kitchen waste and the "Plastic Waste Alms" (*Sedekah Sampah*) initiative. In the "Waste Alms" program, *santri* collect and sort plastic waste, which is then sold to recyclers, with the proceeds used for communal welfare. Observation data recorded a 40% reduction in institutional waste sent to landfills over a six-month period. The technical outputs of these participatory actions are detailed in the following table.

**Table 6: Technical Outputs of Participatory Conservation Programs**



Program	Input	Output / Impact
Eco-Enzyme	Fruit/Veggie Scraps	Organic cleanser, fertilizer, and air purifier
		
Waste Alms	Sorted Plastics	Financial revenue & 40% landfill reduction
		
Eco-Brick	Non-recyclable plastic	Construction material for garden benches



Table 6 provides empirical evidence of the management model's effectiveness in generating tangible ecological and economic benefits. These actions transform the pesantren from a passive consumer of resources into an active producer of environmental solutions (Abasimel, 2023; Widaningsih, 2022). The operational flow of these programs is visualized in the final figure.



**Figure 6: Participatory Action Workflow**

Figure 6 illustrates the "Circular Economy" model applied within the pesantren. This workflow demonstrates that traditional institutions can implement sophisticated environmental systems when they align with their spiritual values and communal structures. These findings collectively demonstrate a replicable model for "Green Deen" management in the modern era.

## 4. RESULTS AND DISCUSSION

### 4.1 Pedagogical Transformation through Prophetic Scaffolding in the Economics Curriculum

The exploration of The discussion of these findings transcends a mere description of environmental activities, revealing a sophisticated intersection between traditional institutional management and the "Green Deen" philosophy. The emergence of the Eco-Pesantren model at Mambaul Hikam

Jombang signifies a paradigm shift where religious dogma is no longer static but functions as a dynamic management tool for ecological resilience. This phenomenon occurs because the institution has successfully rebranded environmentalism from a secular, Western-imposed agenda into an indigenous spiritual obligation (*Amanah*). Unlike the theoretical frameworks proposed by Mangunjaya (2024) and Nasir et al. (2020), which emphasize the theological "what" of Islamic ecology, this study uncovers the "how" of its administrative execution. The seamless integration of policy and piety suggests that when environmental mandates are framed as divine stewardship (*Khalifah*), the psychological barriers to behavioral change dissolve. This contradicts earlier assumptions in secular environmental education research, which often posit that religious traditionalism acts as a barrier to scientific literacy (Sirry, 2020; Utami, 2021). Instead, the data proves that traditionalism, when managed through a value-based hierarchy, provides a more stable foundation for long-term sustainability than purely technocratic approaches. This unique harmonization extends the Environmental Citizenship Theory by demonstrating that "religious capital" acts as a potent catalyst for "ecological capital" in Global South contexts (Abasimel, 2023; Fatma & Karjoko, 2024; Widaningsih, 2022).

The transition from conventional curricula to the integrated PRLH framework at this institution exposes a critical limitation in previous studies that treated religious and environmental education as parallel but separate entities. Previous research by Mujiono (2021) and Cacal et al. (2023) focused on adding environmental "modules" to existing systems, which often resulted in superficial engagement. In contrast, the "Curriculum Infusion" model observed here represents a deeper pedagogical deconstruction, where classical jurisprudence (*Fiqh*) is fundamentally reinterpreted through an ecological lens. By expanding the concept of *Thaharah* (purification) to include chemical-free living through eco-enzymes, the institution has created a "Living Fiqh" that responds to 21st-century waste crises. This finding challenges the conclusions of Utami (2021), who suggested that traditional pesantrens are slow to adopt modern science; the evidence here shows they are not just adopting it, but "sacralizing" it to ensure communal compliance. This strategic fusion provides a robust answer to the research gap regarding the perceived incompatibility between traditional Islamic education and modern Education for Sustainable Development (ESD). It suggests that the success of the Eco-Pesantren lies in its ability to maintain its "Classic-Traditional" identity while operating as a "Modern-Ecological" hub, a dualism that remains underexplored in current international literature (Mangunjaya, 2024; Nasir et al., 2020; Sirry, 2020).

An analysis of the participatory actions, specifically the "Plastic Waste Alms" and eco-enzyme production, reveals a localized "Circular Economy" that operates independently of state infrastructure. This is a significant departure from the findings of Amiruddin et al. (2020) and Abasimel (2023), who argued that Islamic institutions primarily contribute to sustainability through financial philanthropy (*Zakat/Infaq*). The Mambaul Hikam model demonstrates that "philanthropy of action"—the physical labor of sorting waste and fermenting organic matter—carries higher social and spiritual currency within the community. This participatory rigor addresses the "action gap" frequently cited in global environmental psychology, where knowledge rarely translates into practice. The unique success of these programs is attributed to the internal management's use of "Social-Spiritual Pressure," where ecological neglect is viewed as a breach

of communal *Akhlaq* (ethics). This deviates from the findings of Widaningsih (2022), who focused on communication patterns; the current data suggests that the management of physical spaces (the dormitory as a "sacred ecosystem") is the actual driver of transformation. Consequently, this study posits that the Eco-Pesantren is not just a school but a "Micro-State" of sustainability that provides a viable, low-cost alternative to expensive, government-led environmental projects in developing nations (Fatma & Karjoko, 2024; Mangunjaya, 2024; Mujiono, 2021; Nasir et al., 2020).

Reflecting on the broader implications, this research confronts the prevailing global narrative that characterizes traditional religious institutions as scientifically regressive. The Eco-Pesantren management model serves as a "theoretical bridge" connecting the UN Sustainable Development Goals (SDGs) with the foundational values of the *Ummah*. While global frameworks like the Paris Agreement struggle with local implementation, the Mambaul Hikam case proves that "Spiritualized Management" can achieve rapid, high-participation results at the grassroots level. This finding extends the discourse on "Green Deen" by providing an empirical blueprint for institutionalization that can be replicated across the 30,000+ pesantrens in Indonesia. However, a critical inquiry into the model reveals a potential vulnerability: its heavy reliance on the "Charismatic Leadership" of the Kyai. This echoes the cautionary findings of Sirry (2020) regarding the sustainability of institutional reforms after leadership transitions. To mitigate this, the management's current focus on HR development and "Environmental Cadres" acts as a structural safeguard, decentralizing ecological authority among the staff and students. This evolution from "leader-centric" to "system-centric" management is the definitive contribution of this study, offering a scalable strategy for religious institutions worldwide to lead the global fight against climate change while remaining rooted in their spiritual heritage .

## 5. CONCLUSION AND SUGGESTIONS

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### 5.1. Conclusions

Based on the research findings and deep analysis regarding the management of the Eco-Pesantren at Pondok Pesantren Mambaul Hikam Jombang, the following conclusions are drawn:

1. **Institutional Policy Formalization:** The management has successfully transformed environmental stewardship from a moral ideal into a structural mandate through the issuance of "Green Fatwas" and formal SOPs, ensuring that ecological care is recognized as a binding religious and administrative obligation
2. **Strategic Human Resource Transformation:** The creation of specialized "Environmental Cadres" and the systematic training of teaching staff in "Eco-Theology" have successfully decentralized ecological authority, ensuring that the conservation movement is sustained by collective competence rather than solely by leadership charisma
3. **Pedagogical Integration (PRLH):** The institution has effectively implemented an Environmentally Friendly Culture (PRLH) by infusing classical Islamic jurisprudence (*Fiqh*) and ethics (*Akhlaq*) with modern ecological contexts, allowing students to internalize sustainability as a form of worship (*Ibadah*)

4. **Tangible Participatory Impact:** Through practical programs such as "Plastic Waste Alms" and eco-enzyme production, the management has established a functional circular economy that has significantly reduced the institution's environmental footprint while providing economic and educational benefits to the community
5. **Harmonization of Values:** The management model proves that the synthesis of the "Green Deen" philosophy with traditional governance provides a resilient and culturally resonant framework for addressing the modern environmental crisis within Islamic educational landscapes

## 5.2 Recommendations

To address the ongoing challenges of institutional sustainability, it is recommended that the Eco-Pesantren management further digitalizes its waste-tracking systems and strengthens collaborations with external environmental agencies to broaden the impact of its "Waste Alms" program. For future researchers, it is suggested to conduct longitudinal studies or comparative analyses across different types of traditional institutions to evaluate the long-term scalability of this management model and its effectiveness in diverse socio-economic contexts.

### Ethical & Author Statements

**CRedit Statement:** Akhmad Saikhu: Conceptualization, Methodology, Writing – Original Draft, Data Curation, and Supervision. Akhmad Baiquni: Formal Analysis, Investigation, and Writing – Review & Editing.

**Muhammad Khoirul Lutfi:** Validation, Resources, and Writing – Review & Editing.

**AI Policy:** AI tools were used solely for linguistic consistency, grammatical refinement, and the generation of conceptual flowcharts to visualize research processes. The final analysis, interpretation of the harmonization between Islamic values and ecological management, and the synthesis of the **Eco-Pesantren Management Model** are original human outputs.

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