

The Contribution of the *Eco-Pesantren* Model From a Triple Bottom Line Perspective at Al-Amien Prenduan Islamic Boarding School

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ABSTRACT

Purpose – The growing environmental crisis highlights the need for transformative educational models that foster sustainability across environmental, social, and economic domains. This study investigates the contribution of eco-pesantren practices at Al-Amien Prenduan Islamic Boarding School using the Triple Bottom Line (TBL) framework, which emphasizes environmental responsibility (planet), social welfare (people), and economic viability (profit).

Method – This study employed a descriptive qualitative case study approach. Data were collected through participatory observation, in-depth interviews, and document analysis, and subsequently analyzed using the Triple Bottom Line (TBL) framework.

Findings – The findings reveal that *eco-pesantren* practices at Al-Amien Prenduan Islamic Boarding School contribute substantially to all three dimensions of the Triple Bottom Line. In the social dimension (people), ecological citizenship is cultivated through the internalization of environmental values, active participation, and the integration of sustainability principles into educational activities, fostering collective environmental awareness and the development of ecological character and *habitus*. In the environmental dimension (planet), the *pesantren* implements systematic environmental management through greening initiatives and spatial planning, water conservation programs utilizing infiltration wells, and circular-based waste management practices. In the economic dimension (profit), the institution has established an integrated ecological value system that generates direct economic gains from waste processing, indirect benefits through improved operational efficiency, and intangible benefits, including enhanced institutional reputation and a more conducive learning environment. These findings suggest that the integration of the Triple Bottom Line framework into *eco-pesantren* practices not only promotes environmental sustainability but also strengthens social responsibility and economic resilience. The study highlights the importance of adopting a holistic and integrative approach to advancing sustainability within educational institutions.

Keywords: *Eco-pesantren*, Triple Bottom Line, Environmental Education, *Pesantren*.

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INTRODUCTION

The global environmental crisis, characterized by climate change, the degradation of natural resources, and the increasing frequency of natural disasters, impacts not only the environment but also the education sector. In this context, education serves not only as a means of transferring knowledge but also as a means of fostering ecological awareness among students. This is particularly important given the intensifying environmental crisis,

which directly disrupts the learning process. In 2024, approximately 242 million students across 85 countries experienced learning disruptions due to extreme natural disasters such as floods, droughts, and heatwaves (*Global Snapshot of Climate-Related School Disruptions in 2024, 2025*). In Indonesia, more than 5,400 natural disasters recorded throughout 2023 also impacted the education sector (Khairunisa, 2024). This phenomenon is also evident in the floods and landslides that have struck several regions in Sumatra in recent times, causing infrastructure damage and disrupting educational activities. These conditions demonstrate that environmental crises have tangible implications for the continuity of the learning process.

In response, UNESCO has launched initiatives to develop various concepts that integrate environmental aspects into education, including Education for Sustainable Development (Rafiq-uz-Zaman, M., et al., 2025) Eco-Schools, and the Greening Education Partnership. However, their implementation still faces numerous challenges. According to UNESCO data from 2024, environmental issues are often treated merely as supplementary material rather than as a core component of the curriculum. In fact, only about 21% of curricula address climate change. This situation indicates that the integration of environmental education has not yet been fully optimized (GEM Report UNESCO, 2024).

In response to the growing global focus on environmental education, various educational models that integrate environmental concerns have emerged. One such model is the *eco-pesantren* (Nur et al., 2023). The concept of the *eco-pesantren* is an educational framework in which environmental awareness stems from spiritual values, as Islam is a holistic religion that firmly upholds spiritual, social, and cultural aspects. Legally, provisions regarding *eco-pesantren* are outlined in Law No. 18 of 2019 on *Pesantren* and Law No. 32 of 2009 on the Protection and Management of the Environment, which encourage educational institutions to participate in environmental preservation and in maintaining ecosystem balance.

However, the implementation of *eco-pesantren* still faces numerous challenges. These include limited resources, dependence on external parties, the absence of standardized operational guidelines, and practices that remain fragmented and largely ceremonial—all of which constitute major hurdles to implementing *eco-pesantren* (Halimatusa'diyah et al., 2025). In addition, most implementations of eco-boarding schools still focus solely on environmental aspects, without balancing them with social and economic aspects.

Several previous studies have examined the concept of *eco-pesantren* from various perspectives. Aulia's research emphasizes the importance of fostering ecological behavior through institutional culture (Aulia et al., 2024). Meanwhile, Mulya and Salvi examined how spiritual values and environmental education in *pesantren* shape ecological behavior (Wijaya Mulya & Salvi, 2025). On the other hand, Krisdiyanto and Alikodra discussed environmental conservation from an ecological perspective at Al-Zaytun (Kristiyanto & Alikodra, 2021). However, these studies tend to view environmental aspects in a fragmented manner. Research linking *eco-pesantren* to the concept of educational sustainability—which encompasses social, economic, and environmental dimensions—

remains limited, particularly within the context of religious-based educational institutions. This situation indicates that existing research has not yet fully presented an integrative and comprehensive analytical framework.

Therefore, this study offers a unique contribution and novelty that distinguishes it from previous *eco-pesantren* studies through the integration of the *eco-pesantren* concept and the Triple Bottom Line perspective into a comprehensive analytical framework. This study not only explores environmental conservation practices within the *pesantren*, but also analyzes their interconnection with the formation of socio-religious values, the collective culture of the *pesantren*, the educational system, as well as the strengthening of institutional and community-based economic empowerment. Furthermore, this study positions the *pesantren* not merely as an Islamic educational institution concerned with environmental issues, but as a socio-religious institution capable of developing a sustainable development model grounded in *pesantren* values. This study also reinforces the position of the Al-Amien Prenduan Islamic Boarding School as an integrative *eco-pesantren* model that connects education, character building, environmental preservation, and economic empowerment within a sustainable institutional system.

Based on the challenges in implementing *eco-pesantren* and prior research, its implementation requires an integrative approach. The absence of an integrative approach prevents *eco-pesantren* from functioning optimally, as it has yet to balance social, economic, and environmental aspects simultaneously. In this regard, Elkington, through the Triple Bottom Line concept, emphasizes that a system functions optimally if it integrates these three aspects in a balanced manner (Elkington, 1998). Therefore, an integrative framework is needed to balance environmental, social, and economic dimensions in *eco-pesantren* implementation.

In this regard, John Elkington proposes the Triple Bottom Line approach as a framework for evaluating institutions across three main dimensions: social, economic, and environmental (Elkington, 1998). This approach is relevant to implementing *eco-pesantren* because it emphasizes a balance among people, planet, and profit. Through this framework, the implementation of *eco-pesantren* can be analyzed more comprehensively, not only from an environmental perspective but also in terms of its impact on the *pesantren's* social aspects and economic self-reliance.

In this study, *eco-pesantren* is defined as an Islamic boarding school-based educational system that integrates environmental stewardship, social-religious development, and economic self-reliance within the Triple Bottom Line framework (people, planet, and profit), grounded in Islamic spiritual and ethical values. This definition is used as the analytical foundation throughout this study to ensure conceptual consistency in examining *eco-pesantren* practices at the institutional level.

Several studies on the Triple Bottom Line framework in education indicate that this approach is used to assess institutional performance across social, economic, and environmental dimensions. The research by Rosliani and Gamboa, for example, employs a quantitative approach to measure the performance of educational institutions using this

framework and emphasizes the importance of integrating the Triple Bottom Line into their management (Gamboa Aragundi et al., 2022). However, to date, studies on the Triple Bottom Line in education have not extensively addressed religion-based educational institutions, such as Islamic boarding schools.

This study differs by analyzing *eco-pesantren* integratively through the people, planet, and profit dimensions on environmental education and the development of students' ecological character, while Triple Bottom Line studies have been more widely applied in the business sector and general educational institutions, with limited application in the context of Islamic boarding schools. This study differs by analyzing *eco-pesantren* integratively through the people, planet, and profit dimensions, positioning the *pesantren* as a sustainable institution that balances socio-religious development, environmental preservation, and economic self-reliance. The novelty of this study also lies in the context of the Al-Amien Prenduan Islamic Boarding School, which has not previously been examined comprehensively using the Triple Bottom Line perspective. Therefore, this study offers a more holistic analytical framework for understanding sustainability in Islamic boarding schools.

Al-Amien Prenduan Islamic Boarding School is one of the largest Islamic boarding schools in Indonesia. Although this institution does not explicitly label itself as a *pesantren* that implements the *eco-pesantren* concept, in practice it has adopted principles of environmental sustainability. This is reflected in students' daily routines, the enforcement of written regulations, and the establishment of a specialized unit responsible for centralized waste sorting and management (Hamzah, Interview, 2025).

Based on the literature and the unique characteristics of the Al-Amien Prenduan Islamic Boarding School, several research gaps remain. First, practically speaking, there is still a lack of studies examining *eco*-boarding schools using an integrative approach such as the Triple Bottom Line. Second, empirically, boarding school practices have not been extensively analyzed within a framework that simultaneously connects social, environmental, and economic dimensions. Third, no study has specifically examined the Al-Amien Prenduan Islamic Boarding School within a comprehensive framework. Therefore, this study offers a novel approach by integrating the concept of *eco-pesantren* and the Triple Bottom Line perspective into a single, cohesive analytical framework. In line with these gaps, this study aims to analyze the contribution of *eco-pesantren* within the Triple Bottom Line perspective at the Al-Amien Prenduan Islamic Boarding School. The findings of this study are expected to provide a comprehensive overview of *eco-pesantren* practices in relation to the boarding school's social, environmental, and economic self-reliance.

This study is significant because it provides theoretical contributions to the development of environment-based education studies in Islamic boarding schools through the integration of the *eco-pesantren* concept and the Triple Bottom Line perspective. Practically, for *pesantren* administrators, this study may serve as a model for developing an integrative *eco-pesantren* through the strengthening of social, environmental, and economic dimensions within educational systems and institutional

management. For stakeholders in environmental education, this study may provide a foundation for building collaboration, mentoring programs, and empowerment strategies for *pesantren* as Islamic educational institutions oriented toward sustainable development. Furthermore, the findings of this study are expected to strengthen the role of *pesantren* as institutions that contribute to social development, environmental preservation, and sustainable community economic empowerment.

METHOD

This study employs a qualitative case study field research design to gain an in-depth understanding of the implementation of *eco-pesantren* in a real-world context (Moleong, 2016). The research was conducted in 2026 at Pondok Pesantren Al-Amien Prenduan as one of the Islamic boarding schools that integrates the values of environmental education, economic self-reliance, and socio-religious development into its educational system.

The research data sources consisted of primary and secondary data. Primary data were obtained through interviews and observations. The selected informants consisted of eight persons, included *pesantren* leaders, teachers, *pesantren* administrators, students, and managers of *pesantren* business units who had direct experience, roles, and involvement in the implementation of the *eco-pesantren* program. These informants were selected to ensure that the data obtained were in-depth and relevant to the research objectives. Observations were conducted on the daily activities of the *pesantren* related to social, environmental, and economic aspects, while documentation was used to support and strengthen the data obtained from interviews and observations. Meanwhile, secondary data included institutional documents, activity reports, environmental program archives, and other supporting documents relevant to the study.

To ensure data validity, this study employed source triangulation, technique triangulation, and time triangulation. Source triangulation was conducted by comparing information obtained from various informants, while technique triangulation was carried out by comparing the results of interviews, observations, and documentation. In addition, the researcher conducted member checking with several informants to ensure that the interpretation of the data was consistent with the informants' experiences and perspectives.

The data obtained were then analyzed using the Miles, Huberman, and Saldana analysis technique, which covers data collection, data presentation, and conclusion, thereby enabling the researcher to identify patterns and meanings in the data (B. Miles et al., 2014).

RESULT AND DISCUSSION

The Contribution of the *Eco-Pesantren* Model from a Triple Bottom Line Perspective at Al-Amien Prenduan Islamic Boarding School

The results of this study outline the contribution of the *eco-pesantren* model at Al-Amien Prenduan, which can be classified into three strategic pillars of sustainable

management: Ecological Citizenship (People), Environmental Management (Planet), and Integrated Ecological Value (Profit).

The Construction of Ecological Citizenship

The first pillar, Ecological Citizenship, at Al-Amien Prenduan Islamic Boarding School is built through a highly systematic process of cultural internalization. Field findings indicate that ecological citizenship is not merely a cleanliness program but a leadership vision for integrating the ecosystem into the boarding school's identity. Regarding this vision, the leadership emphasizes the profound nature of this commitment through the following statement:

“The calling of the people of *Pesantren* Al-Amien is to preserve the boarding school by developing its environmental ecosystem. It is not just the boarding school itself, but its ecosystem. Thus, the ecosystem becomes a culture—a culture deeply ingrained in every aspect of the boarding school” (*Ahmad, Interview, 2025*).

From a sociological perspective, this statement reflects the formation of an ecological habitus ([Haluza-DeLay, 2008](#)), where environmental awareness transcends conscious cognitive effort and becomes an embodied, unreflective disposition ingrained within the institutional field. This culture is modeled through exemplary behavior, ultimately crystallizing into an intergenerational collective character (*Ahmad, Interview, 2025*).

Field data also confirms that ecological values have been institutionalized in the daily lives of the students. This is evident in the environmental maintenance activities that have become a habit among the boarding school community, as well as the policy to reduce plastic bags in the boarding school's shopping areas. These environmental maintenance activities are known as *Ri'āyah al-Bī'ah* and are carried out twice daily—in the morning and afternoon—involving all students under the supervision of staff members, known as *mu'allim* and *mu'allimah*. The activities are organized using a zone-based system. Each dormitory or section has distinct environmental cleanliness responsibilities. Additionally, environmental maintenance at the boarding school is conducted every Friday through a large-scale cleanup activity known as “*Tandiful A'am*.” These routines demonstrate that environmental responsibility has become an ingrained habit within the institution's culture (*Field Observation, 2025*).

Furthermore, the development of ecological citizenship is also evident through the policy reducing the use of plastic bags at the boarding school's shopping center. Students are required to bring shopping bags or tote bags as an alternative (*Field Observation, 2025*). This policy serves as a practical mechanism to foster environmentally responsible behavior while simultaneously reducing plastic waste production within the boarding school environment.

The philosophical foundation of this framework is a strong theological doctrine that positions environmental stewardship as a moral calling rooted in the Qur'an and Hadith (*Hamzah, Interview, 2025*). This reflects the core tenets of Islamic eco-theology, which

shifts the human-nature relationship from an anthropocentric exploitative paradigm to a stewardship (*khalifah*) model (Majeri Mangunjaya & Elizabeth McKay, 2012; Nasr, 1997). The *pesantren* consistently provides spiritual education, emphasizing that nature is likened to a "mother" whose destruction equates to disobedience (Kudsi Interview, 2026). This is reinforced through the boarding school's core values, known as the "five spirits of the boarding school," which emphasize sincerity, simplicity, self-reliance, Islamic brotherhood, and independence, as well as various environmental messages displayed throughout the boarding school grounds (Document Analysis, 2025). Quranic verses, environmental slogans, and messages regarding humanity's responsibility as stewards are placed in strategic locations, such as the parent reception area, the garden, the cafeteria, and the classroom building (Field Observation, 2025). These values are openly displayed within the boarding school environment and serve as a moral framework guiding students' daily behavior, thereby fostering the development of eco-friendly practices.

In the context of environmental conservation, the values of simplicity and self-reliance encourage the responsible use of resources and strengthen students' awareness of their role as stewards entrusted with the responsibility to protect nature. Such a paradigm fulfills the criteria for profound environmental citizenship (Schild, 2015), in which intrinsic moral duties drive pro-environmental behavior.

In practice, this education is integrated through a Whole-School Approach (Mezirow, 1997) (Shallcross, 2003) across subjects such as Etiquette and Geography (Ghozi, Interview, 2025). It combines biology with *ushul fiqh* to prioritize the prevention of environmental damage (*dar' al-mafāsīd*) (Ghozi, Interview, 2025). The integration of environmental education is also reflected in contextual learning activities. For example, when an environmental disaster occurred in Sumatra, the students were asked to write essays and reflections on the causes and impacts of the disaster. (Ghozi, Interview, 2025). This activity links environmental issues with religious, ethical, and social perspectives, thereby strengthening the students' ecological awareness. Most notably, the *pesantren* employs Sufi methodologies, including *Takhallī* (emptying the mind of falsehood), *Taḥallī* (filling the soul with environmental values), and *Tajallī* (the practice of wise behavior) (Suhaimi, Interview, 2026). This spiritual approach enriches Transformative Learning Theory (Mezirow, 1997) by demonstrating that ecological transformation requires spiritual purification to achieve lasting change.

Despite this system, structural challenges persist in raising awareness among new students and domestic staff, who often prioritize task completion over proper waste sorting (Ahmad, Interview, 2025). This confirms that institutionalizing sustainability is a dialectical process (Lozano et al., 2015). To bridge these gaps, the *Ri'āyah al-Bī'ah* (environmental conservation) program utilizes strict schedules and disciplinary sanctions (Ahmad, Interview, 2025). This dual strategy mirrors the Behavioral Change Model (Steg & Vlek, 2009), where both internal motivations and external structural reinforcements influence environmental action.

The table 1 illustrates the process of constructing ecological citizenship within the *pesantren* environment through three main aspects: culture and character, curriculum, and

regulations. The research findings indicate that ecological awareness is not only fostered through formal education but is also internalized as an organizational culture and passed down as a character trait across generations. The integration of environmental values into the curriculum is carried out through an approach that connects science with Islamic teachings, while *pesantren* regulations reinforce its implementation through a system of habit formation, discipline, and continuous supervision. Thus, ecological citizenship is formed through the synergy between values, knowledge, and daily life practices in the *pesantren*.

Table 1.

Construction Ecological Citizenship

DIMENSION	KEY FINDINGS
Culture and character	Internalization of the ecosystem as organizational culture and intergenerational heritage of character.
Curriculum	Integrative integration of science and religion through the concepts of ushul fiqh and environmental ethics materials.
Regulations	A daily schedule system (<i>Ri'āyah al-Bī'ah</i>) supported by disciplinary sanctions and strict supervision

Environmental Management Implementation

Environmental Management at Al-Amien Prenduan focuses on concrete technical actions to preserve the ecosystem through four main initiatives. The first initiative, Green Action, includes a campaign to plant 1,000 trees and an "unwritten *sunnah* (norms)" mandating the replacement of any vegetation cut during construction (Ahmad, Interview, 2025). Theoretically, this policy is a manifestation of strong sustainability and intergenerational equity (Neumayer, 2013), ensuring that critical natural capital is strictly maintained for future students (Suhaimi, Interview, 2026). Evidence of this can be seen in the boarding school environment, which is filled with various types of vegetation, including both shade trees and fruit-bearing trees. Some of the tree species found include mahogany, trembesi, jackfruit, mango, and kedondong, as well as various ornamental plants such as bougainvillea (Field Observation, 2025). This finding is supported by documentation of the tree-planting program, which indicates that greening activities have been planned as an annual agenda and involve all elements of the *pesantren*, from the leadership, teachers, students, to alumni. (Afandi, Interview, 2026). The presence of such diverse vegetation demonstrates that greening efforts have been effectively implemented within the physical landscape of the *pesantren*.

In addition to the tree-planting program, the culture of greening at Pesantren Al-Amien Prenduan has been deeply rooted since the boarding school's founding. There is a "One Man One Tree" program, in which each student is encouraged to own and care for at least one tree during their time at the school (Suhaimi, Interview, 2026). This tradition is

reinforced by an unwritten custom requiring the replacement of trees felled for development purposes (Ahmad, Interview, 2025).

“Institutionally, this commitment is also reflected in the division of responsibilities within the facilities and infrastructure department, which not only handles physical construction but also includes a unit specifically responsible for the greening of the boarding school’s environment” (Afandi, Interview, 2026).

Furthermore, *the Blue Solution initiative includes infiltration wells and a professional Wastewater Treatment Plant (WWTP), thereby preventing contamination of nearby rivers* (Ahmad, Interview, 2025). The construction of infiltration wells was carried out in response to seasonal flooding that had previously occurred frequently in the *pesantren* area (Iqbal, Interview, 2026). The presence of this infrastructure demonstrates the institution’s efforts to increase water absorption and reduce surface runoff that could potentially cause flooding (Field Observation, 2025). Additionally, the Wastewater Treatment Plant (WWTP) is used to treat liquid waste from toilets and bathrooms before it is discharged into the surrounding environment (Hamzah, Interview, 2026). Although waste management facilities are available, some informants noted that there are still operational challenges in maintaining the effectiveness of some of these treatment units. This strategy demonstrates the application of Systems Thinking (Capra & Luisi, 2014), where the *pesantren* is viewed as an interconnected metabolic organism interacting with its local watershed (Ghozi, Interview, 2025).

The third pillar is Circular Wisdom, implemented through a systematic sorting system for plastic, paper, organic, and residual waste (Ahmad, Interview, 2025). Organic waste is processed into compost, while inorganic waste is upcycled by students into artworks (Kudsi, Interview, 2025). This practice strongly resonates with the Circular Economy framework (Kirchherr et al., 2017). These environmental practices demonstrate the realization of the *eco-pesantren* model in the planet dimension of the Triple Bottom Line framework. A waste sorting system has been implemented through the provision of separate trash bins for various types of waste at several locations within the *pesantren* (Field Observation, 2025). Additionally, there are activities involving the processing of organic waste into compost and the use of inorganic waste as materials for creating artworks by the students (Field Observation, 2025). The *pesantren* manages a waste bank that not only serves internal needs but also receives and manages waste from the surrounding community, including community leaders in the *pesantren’s* vicinity (Field Observation, 2026). Waste utilization practices are also evident in the processing of livestock waste into organic fertilizer. These findings indicate that waste and refuse are not viewed as residues to be discarded, but rather as resources that can be reprocessed into useful products. By emphasizing reduce, reuse, and recycle, the *pesantren* successfully shifts toward a closed-loop system (Ghisellini et al., 2016) in which waste is reconceptualized as a continuous resource.

Finally, energy efficiency is pursued through Solar Power Plants (SPP) and electric motors to replace diesel engines (Iqbal, Interview, 2025). This is evident from the installation of a solar power plant (SPP) obtained through a government assistance

program as part of efforts to transition toward more environmentally friendly energy (Document Analysis, 2026).

Although these SPP have not yet fully replaced the use of conventional electricity because they are not yet equipped with energy storage batteries, to date their presence has served to reduce the electricity costs for the *pesantren* (Hamzah, Interview, 2025).

This confirms that campus sustainability requires simultaneous technological innovation and behavioral adaptation (Wals, 2014) to reduce the institution's carbon footprint. Such an approach reflects the Ecological Modernization Theory (Mol et al., 2020), which posits that environmental reform is achieved through the systematic integration of green technologies into institutional operations.

Integrated Ecological Value

The aspect of Integrated Ecological Value highlights that the economic benefits of *eco-pesantren* are viewed as positive impacts rather than the primary objective. *Pesantren* leaders emphasize that an excessive focus on financial gain risks eroding the spirit of environmental stewardship; successfully addressing waste management alone is already considered an "extraordinary benefit" for the institution (Ghozi, Interview, 2025). This paradigm aligns with the concept of Creating Shared Value (CSV), in which the institution's success is measured by its ability to generate economic value while also delivering societal value by addressing societal challenges (Porter & Kramer, 2018). In this context, the *pesantren* does not seek profit through exploitation, but through ecological restoration.

This orientation is reflected in the institutional values of the *pesantren*. The Panca Jiwa *Pesantren* emphasizes the values of sincerity, simplicity, self-reliance, Islamic brotherhood, and independence, while its institutional orientation is focused on service, development, and self-reliance (Document Analysis, 2025). These values indicate that the institution's success is understood more as a moral responsibility, collective benefit, and community development rather than the accumulation of financial profit. Therefore, the economic benefits generated from various environmental initiatives are understood as positive outcomes of social and ecological commitments, not as the *pesantren's* primary objective.

Nevertheless, financial self-sufficiency is still achieved through various direct and indirect revenue streams. Direct profits are derived from the sale of business by products, sorted plastic bottles, and the processing of livestock waste into economically valuable organic fertilizer (Field Observation, 2025). The results of the observation indicate the existence of a systematic waste management process that supports the creation of economic value. Recyclable plastic waste is collected, sorted, weighed, and stored before being compacted for further distribution (Field Observation, 2025). Additionally, certain types of waste, such as snack packaging, are creatively transformed by students into art pieces and mosaics (Field Observation, 2026)

Furthermore, there is a dedicated composting area where livestock waste and organic materials are processed into organic fertilizer (Field Observation, 2025). The

presence of waste sorting facilities, storage areas, compost piles, and finished fertilizer products demonstrates that environmental resources are actively transformed into economically valuable products within the *pesantren* environment. Although the organic fertilizer produced has not yet been widely marketed in commercial packaging, the product has provided tangible economic benefits to the *pesantren* community (Baihaqi, Interview, 2026). Based on the data found, the fertilizer is utilized for the agricultural needs of the *pesantren* and distributed to teachers residing within the *pesantren* environment. Thus, this program contributes to reducing the cost of purchasing supplies while supporting internal environmental management. These findings indicate that economic value is reflected not only in market transactions but also in the form of cost efficiency and the sustainable use of resources. Theoretically, this represents the operationalization of sustainable entrepreneurship, where environmental problems are transformed into market opportunities that support the institution's financial resilience (Schaltegger & Wagner, 2011). Regarding economic circulation at the student level, a zone-based waste savings scheme is implemented (Ghozi, Interview, 2025). This mechanism mirrors the principle of community-based circularity, where resource recovery provides localized economic benefits that reduce reliance on central budgets.

Indirect benefits are evident in significant operational cost efficiencies, particularly in electricity bills following the implementation of the solar power system (Iqbal, Interview 2025). Solar energy systems have been installed on several strategic buildings, including the dormitory complex and the Tarbiyatul Mu'allimīn al-Islāmiyah (TMI) building, demonstrating the institution's commitment to integrating renewable energy into its daily operations (Document Analysis, 2026). Although the economic benefits are primarily reflected in operational efficiency, this initiative also represents a long-term investment in environmentally friendly infrastructure. These findings confirm that "it pays to be green," as environmental improvements often lead to operational cost savings and better resource productivity (Lanoie, 2008). On the other hand, social investment is carried out by providing a dedicated site for the final disposal of waste to maintain harmonious relations with village residents (Musleh, Interview, 2026). This policy was introduced in response to concerns raised by the local community regarding the increasing volume of waste generated by the *pesantren*. As a solution, the *pesantren* has designated a specific area for final waste disposal to prevent environmental disruption and maintain good relations with the local community (Musleh, Interview 2026). This initiative demonstrates that environmental management at the *pesantren* not only takes ecological aspects into account but also encompasses social responsibility toward the surrounding community.

The most dominant value in this aspect is the Intangible Benefit, such as creating a clean environment and achieving a national reputation through the Adiwiyata Award (Ahmad, Interview, 2025). This demonstrates that the Profit pillar in a TBL framework for educational institutions must include social and reputational capital, which are critical indicators of long-term organizational sustainability (Slaper & Hall, 2011). By redefining profit through the lens of "*Barakah*" (blessing), the *pesantren* shifts from a business-as-

usual model to a truly sustainable business case in which financial, social, and ecological values are inextricably linked (Dyllick & Muff, 2015).

To strengthen this argument, in the *pesantren* tradition, the concept of barakah represents the values of sustainable benefit, social acceptance, and blessed outcomes achieved through ethical, collective, and responsible practices. Therefore, "Barakah-based Profit" can be understood as an expanded interpretation of profit that is not solely oriented toward economic accumulation, but also toward the creation of social benefits, environmental preservation, institutional reputation, and the sustainability of *pesantren* life. Thus, this concept should not be viewed merely as a normative term, but rather as a reinterpretation of the profit dimension within the Triple Bottom Line framework in the context of value-based and sustainability-oriented Islamic educational institutions.

Table 2.

Integrated Ecological Value

DIMENSION	KEY FINDINGS
Direct profit	Sales of organic fertilizer, business byproducts, and services for community leaders.
Indirect profit	Energy cost efficiency (solar power system) and local job creation.
Intangible benefit	Learning comfort, community health, and national reputation (Adiwiyata).

The table 2 shows that the Eko-Pesantren concept's profit dimension is understood not only as financial gain, but also as encompassing integrated ecological, social, and educational values. The research identified three main benefits. Direct profit includes sales of organic fertilizer, by-products of business activities, and community services. Indirect profit includes energy cost efficiency through solar power and local job creation. Intangible benefits include increased learning comfort, community health, and institutional reputation through the Adiwiyata program. These findings demonstrate that economic value in a pesantren environment is generated through a sustainable approach that provides material and non-material benefits to the institution and community.

The Transformation of the Triple Bottom Line in *Eco-Pesantren* Management

The Dialectic of Ecological Awareness in *Pesantren*

An analysis of the "People" pillar of the Triple Bottom Line (TBL) at Al-Amien Prenduan indicates that the institution's success is no longer measured solely by financial parameters. Still, it adds social value for all stakeholders (Elkington, 1998). The implementation of this pillar has transformed into a form of ecological citizenship built through systematic habituation efforts (Anesito L. Cutillas et al., 2025). These practices reflect the *eco-pesantren* model as defined in this study, which integrates environmental awareness, social-religious education, and economic self-reliance within the Triple Bottom

Line framework. These practices reflect the implementation of the *eco-pesantren* model as defined in this study, particularly in the social-religious (people) dimension of the Triple Bottom Line framework. This process of socialization is reflected in various environmental practices found in Islamic boarding schools, such as the twice-daily practice of Ri'āyah al-Bī'ah, the weekly Tandzīf al-'Ām activity, the zone-based assignment of cleaning responsibilities, and restrictions on the use of single-use plastic bags in the boarding school's retail facilities. These practices demonstrate that ecological awareness is built through sustained engagement in collective action, not merely through the transmission of theory alone. This aligns with the fundamental principles of sustainable development, which emphasize that the ecological crisis demands a shift in values and collective consciousness (WCED, 1987).

What is unique at Al-Amien Prenduan is that this foundation of awareness is theological, not secular. The doctrine of humanity as *khalīfah* and the interpretation of nature as *insān kabīr* (the great human) create a moral bond that transcends conventional environmental ethics. This approach is relevant to the Deep Ecology concept of Ecosophy T, in which humans must view themselves as part of nature rather than as a separate entity (Naess, 1989). This theological interpretation should be understood as part of the *eco-pesantren* framework, where Islamic values operationalize ecological awareness within the people dimension of the Triple Bottom Line. The manifestation of Naess's principle of self-realization is clearly evident in the reciprocal relationship (*ḥabl min al-'ālam*) that views nature as "mother." Here, TBL theory is recontextualized: the "People" pillar, originally grounded in corporate logic for social welfare (Jeurissen, 2000), is expanded to encompass the formation of intrinsic ecological obligations, in which environmental concern becomes an inseparable part of santri ritual piety.

This theological orientation is reinforced through various symbolic and institutional representations found within the *pesantren* environment. Core values such as sincerity, simplicity, self-reliance, Islamic brotherhood, and independence are displayed alongside verses from the Qur'an and environmental messages placed in classrooms, gardens, reception areas, and various other communal spaces. Thus, ecological responsibility is consistently framed as a religious obligation inherent in daily life.

This study offers a novel approach by using Sufi methodology as a tool for internalizing values. This internalization process represents the implementation of the *eco-pesantren* model in shaping ecological character within the social-religious dimension of the Triple Bottom Line framework. The effectiveness of this spiritual internalization is evident in the transformation of environmental values into everyday behavior. Ecological responsibility does not stop at religious discourse but is realized through daily environmental conservation activities, collective cleanliness programs, and more environmentally friendly consumption practices. These findings indicate that the stages of *takhallī*, *taḥallī*, and *tajallī* are not merely present at the conceptual level but are also manifested in observable behavioral patterns. Through the trilogy of *takhallī* (emptying oneself of destructive traits), *taḥallī* (filling the soul with conservation values), and *tajallī* (the awareness to act in preserving nature), this approach asserts that the emergence of

Ecological Citizenship in Islamic boarding schools goes beyond mere cognitive or physical compliance; rather, it is a complete spiritual transformation.

Nevertheless, a dynamic dialectic emerges between the idealism of values and sociological challenges on the ground. Difficulties in changing community habits that remain “mixed” regarding waste disposal, along with limitations in human resources, reflect structural barriers in the “People” aspect. The persistence of these challenges indicates that ecological awareness does not automatically emerge simply because institutional values exist. The ongoing implementation of monitoring mechanisms, environmental schedules, and collective responsibility demonstrates that behavioral change requires a combination of cultural internalization and organizational reinforcement. Thus, sustainability within the *pesantren* environment develops through the ongoing interaction between values, discipline, and social practices. This validates the paradigm shift toward an ecological culture (Alkaabi et al., 2023). The synergy between leadership by example and strict regulations successfully creates a dual-control system—social and spiritual—that enriches the “People” dimension in TBL theory (Rosliani et al., 2025).

Effectiveness of Systematic Planetary Management

An analysis of the Planet pillar reveals that Al-Amien Prenduan Islamic Boarding School has moved beyond traditional conservation toward environmental management grounded in systems engineering and intergenerational equity. This commitment is reflected in various environmental initiatives implemented at the *pesantren*, including the “Al-Amien Plants a Thousand Trees” campaign, ongoing reforestation efforts, and institutional policies requiring the planting of replacement trees whenever trees are felled for infrastructure development. These practices demonstrate that environmental conservation has become an integral part of the *pesantren's* long-term development strategy, rather than merely a temporary environmental campaign. The imperative policy—an unwritten rule requiring the planting of a replacement tree for every tree felled for the construction of physical infrastructure—is a concrete manifestation of the principle of Intergenerational Equity.

This initiative is reinforced by the periodic “Al-Amien Plants a Thousand Trees” campaign, which extensively involves alumni and the broader community through a tree-seedling donation scheme to the *pesantren*. These policies are not merely aesthetic efforts but a form of the institution’s moral responsibility to avoid bequeathing an ecological deficit to future generations of students (WCED, 1987). This aligns with the Deep Ecology principle of harmony with the Earth’s carrying capacity, wherein the *pesantren* rejects physical development that sacrifices ecosystem vitality (Naess, 1989). Technically, the application of technology at Al-Amien Prenduan Islamic Boarding School reflects a shift toward Life-cycle Technology as proposed in the Seven Sustainability Revolutions (Jurissen, 2000). The use of Solar Power Plants (SPP), automatic timer installations, and the conversion of diesel engines to electric generators demonstrate significant efforts to mitigate the carbon footprint (Chebyala et al., 2025). The integration of renewable energy is increasingly evident through the installation of solar power systems at several strategic

facilities, including the student dormitory complex and the Tarbiyatul Mu'allimīn al-Islāmiyah (TMI) building (Khodijah et al., 2023). This demonstrates that environmental modernization has been realized in the form of physical infrastructure that supports the institution's daily operations. Furthermore, waste management applies Circular Wisdom, breaking the linear "collect-transport-dispose" chain (Afifi et al., 2025). The transformation of plastic waste into mosaic artworks and the processing of organic waste into compost are evidence of the operationalization of the zero-waste principle, in which waste is positioned as a new resource. The practical implementation of this approach can be seen in the systematic sorting, collection, weighing, storage, and compaction of plastic waste carried out within the boarding school. Additionally, students transform snack packaging waste into mosaic art, while organic waste is processed into compost for agricultural use (Alazaiza et al., 2025). Although the students' mosaic artworks have not yet been commercialized, this program serves as a supportive initiative for students in managing waste wisely. These activities demonstrate that the principles of the circular economy have been integrated into daily environmental management practices ("Principles of a Circular Economy," 2022). These findings distinguish this study from previous research, which typically focused only on the conservation of open natural areas or forests (Kristiyanto & Alikodra, 2021). Al-Amien Prenduan Islamic Boarding School demonstrates its ability to establish a modern environmental management system—including a wastewater treatment plant (WWTP) and infiltration wells—despite being situated in the midst of a densely populated dormitory area. Although there are still challenges in practice with students' waste sorting due to a lack of equipment, this situation actually validates the TBL theory. This theory states that environmental sustainability cannot be achieved instantly but is a gradual process that continually requires improvement and innovation.

Integration of Economic Value and Sustainability

The third pillar of TBL—Profit—is uniquely interpreted through the concept of Integrated Ecological Value. Field data reveal a positive deviation from the traditional capitalist paradigm; economic profit is not the primary goal, but rather the impact of environmental conservation. This approach is consistent with the core values of the *pesantren*, which emphasize sincerity, simplicity, dedication, and self-reliance. Consequently, various environmental initiatives are viewed primarily as a form of moral responsibility and collective service, while economic benefits are seen as a secondary outcome rather than the primary goal (Gulzar et al., 2021). From a TBL perspective, profit is not merely about cash but about sustainable economic prosperity (Jeurissen, 2000). Al-Amien Prenduan Islamic Boarding School demonstrates that waste management does indeed generate direct profit, yet it is framed as a "reward" for preserving nature.

Operational cost efficiencies, such as electricity savings from solar power systems and the use of recycled water, represent tangible economic benefits (Huber & Mohamed, 2023a). Economic value is also generated through resource substitution practices. Organic fertilizer derived from livestock manure and organic waste is used on the *pesantren's* farmland and distributed to teachers living within the *pesantren* community. Although not yet widely marketed, this initiative reduces dependence on external agricultural inputs and

contributes to operational cost efficiency. This aligns with the principle of efficiency in sustainability strategies, where long-term competitiveness is determined by the efficient use of resources (Elkington, 1998). In contrast to findings that identify the economic dimension as the weakest aspect in educational institutions (Rosliani et al., 2025), this *pesantren* has successfully transformed challenges into economic resources independently.

The most fundamental values for the *pesantren* are blessings and social stability. The importance of social stability is reflected in the *pesantren's* response to community concerns regarding waste accumulation. To address this issue, the *pesantren* has designated a specific area for final waste disposal, thereby reducing the potential for environmental disruption while maintaining harmonious relations with the surrounding community. This finding indicates that environmental management at the *pesantren* encompasses both ecological and social responsibilities. The invaluable benefit of a clean and safe environment, free from public lawsuits, aligns with the theory that, in TBL, profit depends on ecological sustainability; no organization can survive in a damaged environment (Jeurissen, 2000).

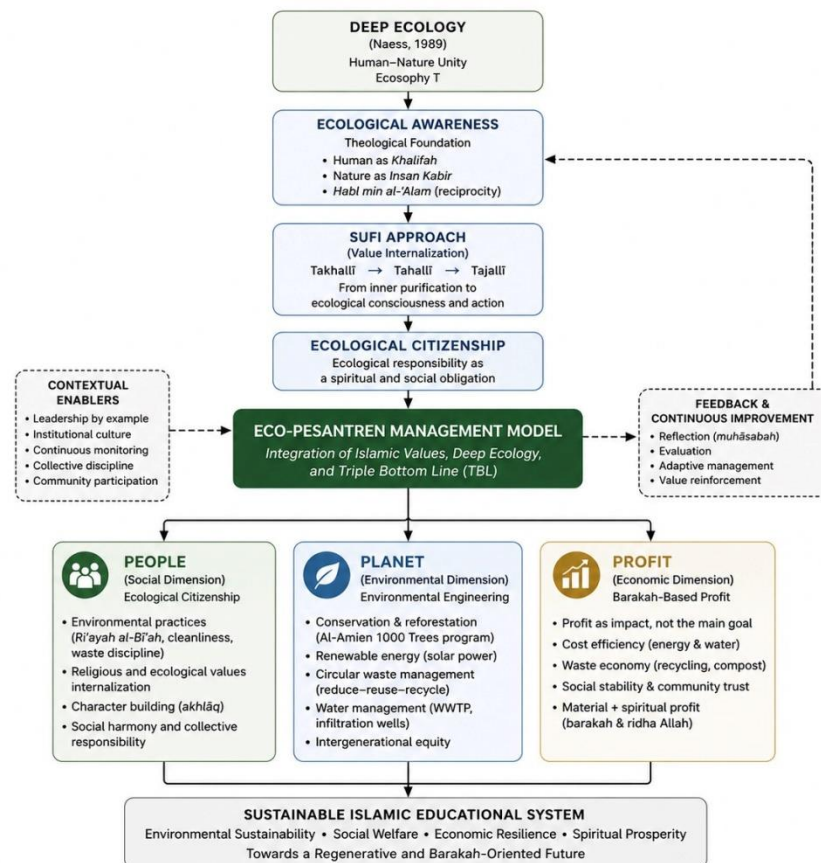
This finding offers a theoretical redefinition of the concept of Profit in TBL, as applied to Islamic educational institutions, through the "*Barakah*-based Profit" model. In this model, profit is no longer understood merely as capital accumulation but as value accumulation rooted in theological obedience (Huber & Mohamed, 2023b). Unlike the Deep Ecology perspective, which separates quality of life from material standards (Naess, 1989), the concept of "*barakah*" (blessing) at Al-Amien Prenduan Islamic Boarding School unites the two. Financial profits from business units and the waste bank are reinvested to fund circular sanitation operations. At the same time, non-financial benefits—such as dormitory comfort and national reputation—are experienced as manifestations of God's grace in response to humanity's efforts to preserve nature. This paradigm stands as an antithesis to conventional capitalism by offering a sustainable, equitable economic model grounded in transcendent values. This conceptualization reflects the *eco-pesantren* model in the profit dimension of the Triple Bottom Line, where economic value is integrated with ecological and spiritual responsibility. This conceptualization reflects the *eco-pesantren* model in the profit dimension of the Triple Bottom Line, where economic value is integrated with ecological and spiritual responsibility.

The figure 1. illustrates a conceptual *Eco-Pesantren* Management Model developed through the integration of the Deep Ecology paradigm, Islamic values, and the Triple Bottom Line (TBL) framework. The model begins with the philosophical foundation of Deep Ecology, which emphasizes the unity of humans and nature (human–nature unity) and the importance of ecological awareness as an integral part of life. This paradigm is then combined with Islamic theological principles that view humans as *khalifah*, nature as a manifestation of Allah's signs, and the existence of a harmonious reciprocal relationship between humans and the environment (*habl min al-'alam*). Ecological awareness is subsequently internalized through a Sufi approach consisting of the stages of *takhalli*, *tahalli*, and *tajalli*, thereby fostering a spiritual consciousness that encourages concrete

environmental stewardship. From this process emerges the concept of ecological citizenship, in which ecological responsibility is understood not merely as a social obligation but also as a religious mandate and moral trust.

Figure 1.

The Integration Between Eco-Pesantren and The Triple Bottom Line Dimensions



CONCLUSION

This study fulfills the initial expectation that Islamic boarding schools not only function as conservative religious educational institutions but also possess strategic capacity to address the challenges of the global ecological crisis. By integrating the Triple Bottom Line (TBL) framework with “theo-ecological values”, the *eco-pesantren* model at Al-Amien Prenduan Islamic Boarding School develops a management framework that transcends conventional sustainability approaches. In the People pillar, the transformation of Ecological Citizenship is fundamentally realized through Sufi methodologies (*takhallī, tahallī, and tajallī*), proving that an environmentally conscious character demands spiritual transformation, not merely compliance with physical regulations. Operationally, the effectiveness of the Planet pillar is demonstrated through systemic ecosystem engineering capabilities amidst dense residential activity, ensuring the realization of intergenerational justice. Furthermore, this study offers a theoretical redefinition of the Profit pillar through the concept of “*Barakah*-based Profit”. Economic self-reliance is no longer positioned as a goal of capital accumulation, but rather as a manifestation of blessings and the direct

impact of nature conservation efforts, which are then recirculated to support environmental management operations. These findings consistently confirm the *eco-pesantren* model as defined in this study, namely an integrated Islamic boarding school system that combines environmental stewardship, social-religious development, and economic self-reliance within the Triple Bottom Line framework grounded in Islamic values. The development prospects of these findings are highly relevant for application as a prototype for environmental management policies within the network of Islamic boarding schools or boarding school institutions at the national level to support the achievement of the Sustainable Development Goals (SDGs). Nevertheless, this model is a dynamic process that still faces challenges in sociological adaptation. Therefore, future research is expected to examine the effectiveness of environmental communication strategies specifically targeting support staff (domestic workers) and to design a fully centralized and integrated waste management system architecture within traditional educational institutions.

DECLARATIONS

Author Contribution

Amini, I. contributed to the development of methodology, data curation, and manuscript review and editing. **Olivia, L.** contributed to the conceptualization, field investigation, formal analysis, and writing of the original draft. **Majid, A. N.** provided supervision, validation, and final review of the manuscript.

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