



Model entrepreneurship based on ecotheology education: pesantren strategies in realizing sustainable development goals (SDGs) in Indonesia

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Abstract

The growing urgency of achieving the Sustainable Development Goals (SDGs) has highlighted the need for innovative educational models that integrate ethical values with practical actions, particularly within faith-based institutions. Islamic boarding schools (pesantren) possess strong potential to contribute to sustainability through their integrative educational systems, yet the connection between religious values and sustainable economic practices remains insufficiently explored. This study aims to analyze the integration of ecotheology education into entrepreneurship practices, examine the process of value internalization, and evaluate its implications for SDG-oriented character development among students. A qualitative approach with an intrinsic case study design was employed at an Islamic boarding school in Indonesia. Data were collected through in-depth interviews, participant observation, and document analysis involving 15 key informants, and analyzed using thematic analysis supported by NVivo software. The findings reveal that the integration occurs through a three-dimensional approach—curricular, cultural, and operational—enabling the transformation of ecotheological values into sustainable entrepreneurial practices. The internalization process follows a cyclical pattern involving value formation, habituation, implementation, and reflection, resulting in the emergence of a *Santri Ecopreneur* profile characterized by ecological awareness, economic competence, and social responsibility. This study concludes that ecotheology-based entrepreneurship provides a viable and replicable model for linking religious education with sustainable development practices, contributing both theoretically to integrative Islamic education and practically to the advancement of SDGs at the community level.

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INTRODUCTION

The global commitment to achieving the Sustainable Development Goals (SDGs) by 2030 has increasingly emphasized the importance of multi-sectoral collaboration, including the active involvement of education systems. In this context, educational institutions are no longer viewed solely as knowledge transmitters, but also as agents of social transformation capable of shaping sustainable values and practices (Nölting et al., 2020; Schröder & Krüger, 2019). Among various educational models, faith-based institutions have gained attention due to their moral authority and deep-rooted influence within communities. In Indonesia, Islamic boarding schools (pesantren) represent a unique educational ecosystem that integrates religious teachings, social life, and economic activities (Anshori & Pohl, 2022; Rohani, 2024; Roqib, 2021). This integrative nature positions pesantren as strategic actors in translating global sustainability agendas into local practices. However, the extent to which these institutions operationalize sustainability principles remains uneven and underexplored.

Empirical evidence suggests that many pesantren have initiated programs related to environmental awareness and economic empowerment, yet these efforts often operate in fragmented ways. On one hand, environmental education in pesantren tends to remain normative,

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focusing on theological doctrines without practical implementation (Anshori & Pohl, 2022; Roqib, 2021). On the other hand, pesantren-based entrepreneurship programs frequently prioritize economic self-reliance while overlooking ecological sustainability (Budiyono, 2025; Marlina, 2026). This dichotomy creates a paradox in which institutions that promote ethical values may inadvertently contribute to unsustainable practices, such as inefficient resource use or inadequate waste management. Several recent studies highlight similar tensions in faith-based education systems, where the gap between value internalization and behavioral transformation persists (D'Agostino & Asadullah, 2025; Tahom & Srisophon, 2025). Consequently, there is a pressing need to bridge the divide between religious values and sustainable economic practices within pesantren contexts.

The urgency of this issue is further intensified by the growing environmental challenges faced in Indonesia, including waste accumulation, water scarcity, and climate vulnerability. As community-centered institutions, pesantren are expected to play a proactive role in addressing these challenges through education and social engagement (Hajar, 2024; Rohmah et al., 2025; Ulum et al., 2025). Moreover, the increasing emphasis on Education for Sustainable Development (ESD) underscores the importance of integrating cognitive, affective, and behavioral dimensions in learning processes (UNESCO, 2021). Without a structured framework that connects theological values with real-world actions, sustainability education risks becoming merely symbolic. Therefore, transforming pesantren into centers of sustainable practice is not only relevant but also necessary for achieving broader societal impact. This transformation requires innovative models that go beyond conventional pedagogical approaches.

One promising conceptual pathway is the integration of ecotheology into educational and economic practices. Ecotheology, which emphasizes the ethical relationship between humans and the environment, provides a strong philosophical foundation for sustainability grounded in religious teachings (Bratton, 2018; Şencan, 2025). In Islamic thought, principles such as *khalifah* (stewardship), *mizan* (balance), and *hifzh al-bi'ah* (environmental preservation) offer a comprehensive framework for ecological responsibility. However, existing implementations of ecotheology in educational settings often remain abstract and disconnected from practical applications (Gulo et al., 2024; Masoga, 2024; Runtuwene, 2025). Integrating these values into entrepreneurship education could potentially transform them into actionable principles that guide sustainable economic activities. Such integration aligns with the emerging discourse on ecopreneurship, which combines environmental consciousness with entrepreneurial innovation (Buzohera & Mwakipesile, 2024).

A growing body of literature has explored environmental education, Islamic education, and entrepreneurship in isolation, but integrative studies remain limited. Recent research highlights the role of Islamic education in promoting sustainability values (Hajar, 2024; Ismet et al., 2025; Setianingrum et al., 2024), while other studies focus on pesantren entrepreneurship as a tool for economic empowerment (Hakim et al., 2025; Husaini, 2025; Mustaghfiri, 2020; Setiawan, 2024). Additionally, ecopreneurship has been widely discussed in global contexts as a strategy for sustainable development (Alawamleh et al., 2023; Galkina, 2021; Gunawan et al., 2021). Despite these advances, most studies treat these domains as separate constructs, resulting in a lack of comprehensive frameworks that integrate theological values, educational processes, and economic practices. Furthermore, existing studies rarely examine how such integration contributes directly to measurable SDG outcomes at the institutional level. This indicates a conceptual and methodological gap that warrants further investigation.

Several recent empirical studies (2021–2025) reinforce this limitation by showing that sustainability initiatives in educational institutions often lack coherence across curricular, cultural, and operational dimensions (Adams et al., 2018; Holst, 2023; Weiss et al., 2021). In the context of Islamic boarding schools, research tends to focus either on textual interpretations of environmental ethics or on economic activities without sustainability considerations (Anshori & Pohl, 2022; Hajar, 2024). As a result, the potential of pesantren as holistic sustainability hubs remains underutilized. Moreover, there is limited discussion on how internalization processes occur, particularly in transforming abstract values into concrete entrepreneurial practices. This gap highlights the need for a model that not only integrates multiple dimensions but also explains the mechanisms through

which values are translated into action. Addressing this gap is crucial for advancing both theory and practice in sustainable Islamic education.

Responding to these challenges, this study aims to analyze the integration of ecotheology education into entrepreneurship practices within an Islamic boarding school context. Specifically, it seeks to examine the strategies employed in embedding ecological values into economic activities, to explore the internalization process of these values among students, and to evaluate their implications for achieving SDGs. The study contributes theoretically by proposing an integrative framework that connects ecotheology, education, and ecopreneurship within a unified model. Practically, it offers insights for policymakers and educational practitioners on how pesantren can function as effective agents of sustainable development. By positioning pesantren as both learning centers and sustainability laboratories, this research provides a novel perspective on the role of faith-based education in addressing global environmental challenges. Ultimately, the study aspires to bridge the gap between religious values and sustainable practices through a contextually grounded and operational model.

METHOD

Research Design

This study employed a qualitative approach using an intrinsic case study design to explore in depth how ecotheology education is integrated into entrepreneurship practices within an Islamic boarding school context. A qualitative approach was chosen because the study focuses on understanding meanings, processes, and social dynamics, particularly related to value internalization and behavioral transformation. The intrinsic case study design was selected as the research examines a unique and context-rich phenomenon within a specific institution, allowing for a holistic and contextualized understanding. This design enables the researcher to capture the interaction between educational values, curriculum, and real-world entrepreneurial practices within the pesantren ecosystem.

Research Site and Time

The research was conducted at Pondok Pesantren Al-Amien Prenduan, Sumenep, East Java, Indonesia, which is recognized as a modern Islamic boarding school integrating formal education, religious instruction, and entrepreneurship activities. This site was purposively selected due to its active business units and its potential for implementing sustainability-oriented educational practices. Data collection was carried out over a three-month period, from January to March 2026, which allowed the researcher to observe both routine educational activities and entrepreneurial practices in a natural setting.

Participants

The participants in this study consisted of 15 key informants selected through purposive sampling, based on their direct involvement in educational and entrepreneurial activities within the pesantren. The participants included: (1) three pesantren leaders or administrators as policy-makers, (2) four teachers responsible for subjects such as *aqidah-akhlak*, *fiqh*, and entrepreneurship, (3) five students actively engaged in business units, and (4) three business unit managers responsible for operational implementation. The inclusion criteria required participants to have at least one year of experience in relevant activities, active involvement in the program, and willingness to participate in interviews. This sampling strategy ensured that the data collected were rich, relevant, and representative of the studied phenomenon.

Research Instruments

The primary instrument in this study was the researcher as the key instrument, supported by several data collection tools, including semi-structured interview guidelines, observation sheets, and document analysis formats. The interview guidelines were developed based on key indicators such as the integration of ecotheological values, sustainable entrepreneurship practices, and contributions to the Sustainable Development

Goals (SDGs). Observation sheets were used to record real activities in the field, such as organic farming, waste management, and student business operations. Documentation included curriculum materials, activity reports, photographs, and institutional archives. These instruments were developed based on relevant theoretical frameworks in ecotheology and ecopreneurship.

Instrument Validity and Reliability

The validity of the instruments was ensured through content validity, involving two experts in Islamic education and sustainability to evaluate the relevance and clarity of the indicators. Data credibility was strengthened through triangulation techniques, including triangulation of sources (different informants), methods (interviews, observations, and documentation), and time. In addition, member checking was conducted by confirming interview results with participants to ensure the accuracy of interpretations. Reliability was maintained through consistent data collection procedures, systematic documentation, and the use of reflective notes (audit trail) to track the research process and minimize bias.

Data Collection Procedures

Data collection was conducted in three systematic stages. The first stage was **preparation**, which included designing instruments, obtaining research permission, and selecting participants. The second stage was data collection, where the researcher conducted direct observations, in-depth interviews, and document collection. Interviews were conducted face-to-face, lasting between 45 and 90 minutes, and were recorded with participants' consent. The third stage was data organization, which involved transcribing interview recordings, conducting initial coding, and storing data systematically in digital formats for further analysis. To provide a clear overview of the research process, this study presents a flowchart that illustrates the sequential stages of the methodology, starting from the preparation phase to the conclusion drawing stage. The flowchart is intended to enhance the transparency of the research design and to facilitate replication by other researchers. By visualizing the process, readers can better understand how data were systematically collected, managed, and analyzed within this qualitative case study.

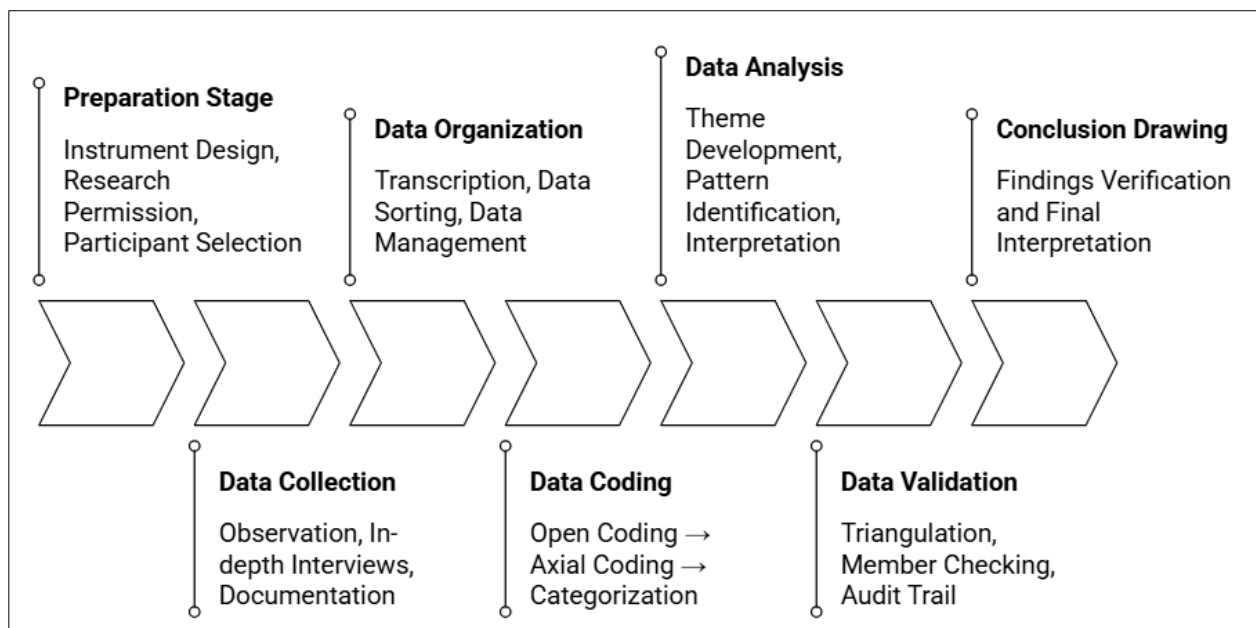


Figure 1. Research Methodology Flowchart of Ecotheology-Based Entrepreneurship Study

The research methodology is structured into sequential stages as illustrated in Figure 1. The process begins with the preparation stage, followed by systematic data collection through multiple techniques. The collected data are then organized and coded to identify meaningful patterns. Subsequently, thematic analysis is conducted to develop key findings, which are validated through triangulation and member checking. The process concludes with interpretation and verification to ensure the credibility and trustworthiness of the research results.

Data Analysis Techniques

Data were analyzed using thematic analysis following the interactive model of Miles, Huberman, and Saldaña (2014). The analysis process involved several stages. First, **data reduction** was carried out by selecting, simplifying, and focusing raw data from interview transcripts and observation notes. Second, coding was conducted using open coding to identify meaningful units, followed by axial coding to group these codes into categories. Third, categorization and theme development were performed to generate key themes such as value integration, sustainable entrepreneurship practices, and SDG contributions. Fourth, data display was presented in descriptive narratives and matrices to identify patterns and relationships. Finally, conclusion drawing and verification were conducted iteratively to ensure the validity of findings. The analysis process was supported by NVivo 12 software to enhance systematic data management and transparency.

Research Ethics

This study adhered to strict research ethics principles. All participants were informed about the purpose of the study and provided informed consent prior to participation. Confidentiality was maintained by anonymizing participant identities using pseudonyms. All data were used solely for academic purposes and stored securely. The researcher also ensured objectivity by minimizing bias and respecting the cultural and social values of the pesantren environment. These ethical considerations ensured that the research was conducted responsibly and in accordance with international academic standards.

RESULTS AND DISCUSSION

Results

Al-Amien Prenduan Islamic Boarding School's Strategy in Integrating Eco-theology Education into Santri Entrepreneurship Practices to Support the Achievement of Sustainable Development Goals (SDGs)

Theoretically, Islamic eco-theology functions as a normative framework that transforms spiritual values into practical environmental ethics (Khalid, 2019, p. 462). Values such as *khalifah* (stewardship), *mizan* (balance), and *hifzh al-bi'ah* (environmental preservation) are not interpreted as abstract concepts, but are operationalized into basic principles in pesantren economic activities. Observation data at Pesantren Al-Amien Prenduan confirms that the internalization of these values has become the foundation of the organizational culture. Pesantren administrators consistently convey that every business activity must consider long-term *maslahah* (common good), not just short-term financial gains. This is in line with Zubair's opinion that eco-theology in pesantren has the potential to become an ethical basis for contextual sustainable development (Zubair, 2022a, pp. 89–91).

Integrative education theory emphasizes the importance of integrating cognitive, affective, and psychomotor knowledge into a single learning unit (Fathurrohman, 2019). Interviews with teachers of Fiqh and Akhlak revealed that eco-theological values are incorporated into specific topics, such as *thaharah* (purification) in relation to water conservation, or the concept of *ihya al-mawat* (reviving dead land) in the context of sustainable agriculture. Furthermore, observations at the pesantren's Organic Farming Unit show that this learning does not stop in the classroom. Students who learn about *mizan* immediately put it into practice by making compost from the boarding school canteen waste and measuring the balance of the ecosystem in biofloc catfish farming. This integration is an implementation of the hidden curriculum and experiential learning concepts developed at the boarding school (Niam, 2021, pp. 16–17).

The theory of Islamic social entrepreneurship emphasizes *value creation* that goes beyond profit, including social and environmental impacts (Suharto, 2020a, p. 156). Data from interviews with business unit managers and field observations reveal the business model applied. Goat farming units not only sell goats, but also utilize goat manure for biogas (supporting SDG 7: Clean Energy) and organic fertilizer for the pesantren's gardens (SDG 12: Responsible Consumption and Production). The Bariklana pesantren's bottled water business unit implements a *reverse osmosis* system and uses refillable gallons to reduce plastic waste. This practice demonstrates a shift from a consumptive pattern to a productive-ecological pattern, where students are not only taught entrepreneurship but entrepreneurship based on circular economy principles.

Research by Prasetyo & Arifin shows that collaborative projects are effective in building problem-solving skills (Prasetyo & Arifin, 2023a, p. 127). At Al-Amien Islamic Boarding School, this can be seen in the Santri Waste Bank program. Interviews with santri managing the waste bank revealed that they not only manage the sorting and sale of inorganic waste (supporting SDG 11: Sustainable Cities and Communities), but also prepare simple financial reports, calculate the economic value of residues, and set aside profits for the poor santri (SDG 1: No Poverty). This project serves as a concrete medium for synergizing ecological, financial, and social literacy, as well as an effective project-based learning strategy.

The theory of transformational leadership in Islamic education emphasizes the role of leaders as agents of change who influence followers through vision, intellectual stimulation, and individual consideration (Syah, 2022). Interviews with boarding school caregivers and observations of policies show that commitment to the environment is manifested in structural decisions. The pesantren issued a policy banning single-use plastics in internal areas, allocated special land for urban farming, and included environmentally friendly behavior indicators in the assessment of students' attitudes. The visionary leadership of the kyai became *the prime mover* in creating a pesantren ecosystem that supports the internalization of eco-theological values into all aspects, including entrepreneurship.

Achieving the SDGs requires multi-stakeholder partnerships (SDG 17). Data from documentation studies and interviews show that Al-Amien Islamic Boarding School does not operate in isolation. They have established partnerships with the District Environment Agency for composting training, with Trunojoyo Madura University for research on drought-resistant local food crops, and with local farmer groups to market organic fertilizers produced by students. These partnerships create a local circular economy ecosystem in which the pesantren acts as a knowledge hub and production hub that drives the green economy in the surrounding community, a finding that reinforces Wekke & Hamid's research on the role of pesantren in community development (Wekke & Hamid, 2019a, p. 343).

Despite showing progress, this integration is not without challenges. In-depth interviews with several ustadz revealed technical obstacles such as limited capital for developing environmentally friendly technology (e.g., solar panels) and a heavy curriculum load, which requires a high degree of creativity to incorporate eco-theology material. On the other hand, some santri acknowledged a gap between understanding values and changing daily habits. To overcome this, pesantren developed adaptation strategies, such as: (1) strengthening guidance through *muhadharah* (regular lectures) and habituation (*riyadhah*), (2) forming mentor groups among santri in business units, and (3) seeking alternative funding through corporate CSR partnerships. These challenges and responses confirm the theory of change in educational organizations, which is non-linear and requires a multi-strata approach (Sutrisno *et al.*, 2023, p. 112).

The findings of this study make a significant contribution both theoretically and practically. Theoretically, this study enriches the integrative Islamic education model by

showing that eco-theology can function as a *bridging concept* that connects the realm of faith and morals with the realm of economics and sustainable development practices. The model at Al-Amien Islamic Boarding School reinforces Hidayat & Robani's research that Islamic boarding schools are key actors in localizing SDGs through a cultural-religious approach called *Practicality*, the integrative strategy implemented through embedded curricula, collaborative entrepreneurship projects, green leadership, and strategic partnerships can serve as a prototype or *best practice* for Islamic boarding schools and other Islamic educational institutions in Indonesia to contribute to the sustainable development agenda, while shaping a generation of Muslim ecopreneurs who excel spiritually, intellectually, and socio-ecologically.

Internalization of Ecotheology Education Values in the Entrepreneurship Model Developed by Al-Amien Prenduan Islamic Boarding School in Sumenep to Support the Achievement of the Sustainable Development Goals (SDGs) of the United Nations

Islamic ecotheology theory emphasizes that nature is a sign of God that must be preserved as a trust. Data from interviews with boarding school caregivers and teachers revealed that these values are not taught in separate subjects but are internalized as a *hidden curriculum*. The concept of *mizan* (balance) from Q.S. Ar-Rahman: 7-9 and *the prohibition of causing destruction* (Q.S. Al-A'raf: 56) are introduced in discussions at majelis ta'lim, lectures, and routine guidance sessions. Observations show that before starting practices in organic gardens, students are invited to reflect on the essence of plants as creatures that glorify Allah. This is in line with Zubair's findings that traditional Islamic boarding schools view ecology as an integral part of theology (Zubair, 2022a, p. 90), but at Al-Amien, this value is deliberately linked to economic actions that will be carried out, creating a strong spiritual foundation before action.

Suharto's research shows that pesantren entrepreneurship is often oriented towards meeting basic needs (Suharto, 2020b, p. 160). Findings in the field reveal more advanced developments. Eco-theological values are translated into standard operating protocols in business units. For example, from the principles of *hifzh al-bi'ah* (environmental preservation) and *thaharah* (purity), strict rules have been established in dairy cattle units regarding the processing of manure into biogas and liquid fertilizer. Interviews with unit managers explain that this is not just a business, but the implementation of *fiqh al-nazhafah* (fiqh of cleanliness) and preventing *dharar* (harm) to the environment. The unit's SOP document shows how the procedure for wudhu (ablution) that does not waste water inspired a drip irrigation system in vegetable gardens. This shows a leap from normative ecotheology to applied Islamic environmental ethics.

Observational findings in IPSI classes concretize an integrative model that has so far remained theoretical (Niam, 2021). The data shows a circular learning structure: (1) Understanding Values: Examining the text of the book *Ihya Ulumuddin* on human responsibility towards the earth, (2) Solution Design: Designing products (e.g., compost, herbal soap) that solve environmental problems in Islamic boarding schools, (3) Production and Marketing: Producing with zero waste principles and marketing them with the label "Produk Santri Lestari" (Sustainable Santri Products), (4) *Spiritual Reflection*: Evaluating the impact of efforts on environmental sustainability as a form of worship. This model directly supports SDG 4.7 on education for sustainable development, while also being a novelty of this research.

The pesantren business unit operates with an *ecopreneurship* paradigm in line with Prasetyo & Arifin, which states that observations of the paper and plastic waste recycling unit show that, in addition to profit, this unit has non-financial metrics: the volume of waste managed and the number of students educated (Prasetyo & Arifin, 2023b, p. 129). Interviews with student managers revealed that their target is not to make a large profit, but to make

the boarding school free of plastic waste (supporting SDGs 11 & 12) and to create environmentally friendly jobs (SDG 8). The profit-sharing concept from this unit is used to fund scholarships for underprivileged students, which indirectly contributes to SDGs 1 and 4. This reinforces the theory that faith-based social entrepreneurship can be a multidimensional catalyst for SDGs (Hidayat & Robani, 2021, p. 297).

Pesantren do not operate in a vacuum. Data from interviews with the surrounding community shows the existence of a "*Bina Lingkungan*" (Community Development) program in which biogas technology and organic farming techniques from the pesantren are transferred to local livestock farmers and farmers. This confirms the role of Islamic boarding schools as social engines (Azra, 2012) that have evolved into *sustainability hubs*. This partnership model is not charitable in nature, but rather builds a circular economic ecosystem: fertilizer from the boarding school's livestock is used by local farmers, and the boarding school's kitchen purchases the farmers' produce. This model directly supports SDG 2 (food security) and SDG 17 (partnerships). Observations show an increase in the participation of women (mothers) in agricultural product processing business groups, which indicates support for SDG 5.

Although this model has proven successful, in-depth interviews with unit managers reveal tensions between ecological idealism and market logic. For example, in the food production unit, there is a tug-of-war between using environmentally friendly packaging (which is more expensive) and ordinary plastic packaging (which is cheaper and more popular in the market). "We must continue to educate consumers that the slightly higher price is to save the earth," said one manager. This challenge confirms Wekke & Hamid's research on the gap between environmental awareness and daily economic practices in Islamic boarding schools. Here, the role of sustainable eco-theology education for consumers (internal and external) becomes crucial.

The findings of this study offer a framework that can be adapted by other Islamic boarding schools. The key to its success lies in three things: (1) Visionary leadership that views eco-theology and entrepreneurship as two sides of the same coin of Islam, (2) A flexible curriculum structure that allows for the integration of values and skills, and (3) The establishment of business units that serve as learning laboratories. Unlike conventional pesantren entrepreneurship models that focus solely on income-generating activities, the model at Al-Amien places the process of values education and ecological character building as the main output, while financial profit is a secondary impact. It is this paradigm shift that makes it an effective strategy for SDGs.

Theoretically, this research enriches Islamic education by weaving together the concepts of eco-theology, social entrepreneurship, and SDG studies into a single framework. These findings show that traditional religious institutions such as Islamic boarding schools can be agile and contextual agents of change in the global agenda. In practical terms, this model can be adopted by the Ministry of Religious Affairs and the Ministry of Environment to be formulated into a national guideline for "Sustainable Islamic Boarding Schools." The policy recommendation is the need for fiscal and non-fiscal incentives for Islamic boarding schools that implement the ecopreneurship model, as well as the integration of SDGs and sustainable entrepreneurship modules into the religious education curriculum at all levels.

Implications of the Ecotheology-based Entrepreneurship Model on Character Building of Islamic Boarding School Students Oriented towards Achieving Sustainable Development Goals (SDGs)

Character education in Islamic boarding schools is not only oriented towards the formation of good character in social relations (*hablum minannas*), but also includes responsibility for the environment (*hablum minal 'alam*) as a manifestation of faith (Mujib, 2019). Observation and interview data at the Al-Amien Prenduan Islamic Boarding School

confirm that the ecotheology-based entrepreneurship model successfully bridges these two dimensions. For example, in the organic farming unit, the value of *khalifah fil ardh* (QS. Al-Baqarah: 30) taught in class is not only dogmatic material but is operationalized through the direct practice of students in managing land without chemical pesticides. This is in line with Zubair's findings, which state that the internalization of eco-theological values requires a medium of concrete practice in order to become an inherent character trait.

Interview data with pesantren caregivers revealed that the principles of *hifzh al-bi'ah* (preserving the environment) and *isyraf* (prohibition of excess) were deliberately integrated into the entrepreneurship module. The theory of ecopreneurship or green entrepreneurship emphasizes the creation of businesses that are not only profitable but also eco-friendly and socially inclusive (Suharto, 2020a). Observations show that students involved in the plastic waste recycling unit to produce handicrafts not only learn to calculate profit margins but are also invited to analyze the socio-ecological impact of plastic waste. This process builds critical competencies that go beyond conventional business skills, namely the ability to see environmental problems as ethical business opportunities, a key characteristic in realizing SDG 12 (Responsible Consumption and Production).

In-depth interviews with senior students managing the renewable energy (biogas) unit show complex character development. They are not only technicians but also ambassadors for clean energy who promote the importance of SDG 7 (Affordable and Clean Energy) to the surrounding community. These findings reinforce the theory of Hidayat & Robani (2021) that Islamic boarding schools have the potential to be agents of change for the SDGs through transformative education. The character of ecopreneur santri is an amalgamation of: (1) ecological sensitivity (from eco-theology education), (2) a spirit of innovation and economic independence (from entrepreneurship training), and (3) social awareness (from the values of *ukhuwah islamiyah*) (Hidayat & Robani, 2021). This trilogy of character traits is the catalyst for the simultaneous achievement of multiple SDGs.

Analysis of curriculum documents and observation of daily activities reveal unique integration strategies. In addition to the explicit curriculum in the form of special courses/training, these values are internalized through the hidden curriculum in the pesantren culture. For example, rules for turning off lights and air conditioning (SDG 13), a water-saving system for wudhu' (SDG 6), and mandatory community service in the pesantren garden create a constant environment for habit formation. According to Niam (2021), the effectiveness of pesantren character education lies in the power of routine and a cohesive community. In this context, the entrepreneurship unit becomes an advanced laboratory where these habits are tested and developed into more structured and economically impactful solutions.

One of the challenges of character education is ensuring the sustainability of its impact. Data from interviews with alumni who now manage environmentally friendly businesses in their hometowns shows that the character formed during their time at the pesantren has resilience and transferability. They apply similar principles in different contexts, indicating the successful internalization of values. At the institutional level, observations show that pesantren are beginning to adopt the principles of sustainable pesantren-enterprise by creating policies such as prioritizing the purchase of local raw materials (SDGs 8 and 12) and conducting simple energy audits. This shows that this model not only shapes the character of santri personally, but also encourages systemic institutional transformation of pesantren towards a more sustainable paradigm.

Although this model is generally effective, interview data also reveals resistance and challenges. Some students and even teachers initially considered environmental issues and entrepreneurship as two domains separate from the main goal of seeking religious knowledge. This reflects the dichotomy between religious knowledge and worldly

knowledge that is still deeply rooted in some traditional Islamic boarding schools (Suharto, 2020b). However, observational data shows that this resistance was successfully overcome through the *dakwah bil haal* approach (preaching through concrete actions). When students witnessed firsthand that proper waste management could generate income and at the same time make the pesantren environment healthier and more comfortable for learning, their initial resistance turned into acceptance. This process is a concrete form of participatory and experience-based character education.

The contextualization of the model on Madura Island, which faces ecological challenges such as critical land and limited clean water, gives it greater significance. Data from interviews with the community around the pesantren indicates that the organic farming practices and wudu water management taught by the pesantren are beginning to be emulated by residents. The implication is that the character of the santri (boarding school students) is not only having an internal impact, but also a spill-over effect on the external community, thereby expanding the contribution to the SDGs, particularly SDG 6 (Clean Water and Sanitation) and SDG 15 (Life on Land). This finding reinforces Wekke & Hamid's argument about the role of Islamic boarding schools as community learning centers for sustainable development.

Based on the above discussion, it can be concluded that the eco-theology-based entrepreneurship model has proven effective in shaping the multidimensional character of santri: religious, eco-literate, innovative, and solution-oriented. The success of this model lies in its ability to translate abstract theological values (ecotheology) into ethical-practical actions (entrepreneurship) within the framework of global goals (SDGs). The theoretical implication of this research is an enrichment of the contemporary Islamic education discourse that emphasizes the integration of the trinity: *faith, science, and action*. Meanwhile, the practical implication is that this model can be used as a prototype or reference framework for other Islamic boarding schools in Indonesia that want to contribute significantly to the sustainable development agenda without neglecting their mission as religious character-based educational institutions.

CONCLUSION

This study demonstrates that integrating ecotheology education into entrepreneurship practices within Islamic boarding schools can serve as an effective strategy for advancing the Sustainable Development Goals (SDGs). Through a three-dimensional approach (curricular, cultural, and operational) the pesantren successfully transforms abstract theological values into concrete, sustainable economic activities. The internalization process occurs through a cyclical mechanism that connects value formation, habituation, practical implementation, and reflective evaluation, resulting in meaningful behavioral change among students. The findings highlight that this integrative model not only strengthens students' ecological awareness but also develops their entrepreneurial competence and social responsibility. The emergence of the Santri Ecopreneur reflects a multidimensional character that combines religious commitment, environmental ethics, and economic innovation. In this context, entrepreneurship is not merely oriented toward profit but is redefined as a value-driven practice that contributes to environmental sustainability and community empowerment. Theoretically, this study contributes to the development of an integrative framework linking ecotheology, education, and ecopreneurship within a unified model of sustainable Islamic education. Practically, it provides a replicable model for Islamic educational institutions to operationalize sustainability values in real-world contexts. Overall, the study affirms that pesantren have significant potential to act as transformative agents in bridging religious values and sustainable development practices in a holistic and impactful manner.

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