



Ecotheological Construction in Islamic Education: A Study of the Ethics of Environmental Conservation and Deforestation

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Abstract

This study examines the construction of Islamic eco-theological values in the Islamic education system, with a particular focus on the ethics of environmental conservation learning and responses to deforestation issues. This study is motivated by the urgency of the global ecological crisis and the strategic potential of religious education in shaping sustainable environmental awareness. Using a qualitative approach with a case study design at Islamic boarding schools in East Java, this study collected data through participatory observation of the learning process, in-depth interviews with teachers, ustaz, and santri, as well as analysis of curriculum documents and syllabi. The findings reveal that the construction of Islamic eco-theological values is built through four integrated approaches. First, the integration of theological concepts such as *khalifah*, *amanah*, and *mizan* (balance) into formal subjects. Second, the implementation of transformative learning ethics that link theory with direct field practice, such as reforestation and waste management programs. Third, the internalization of values through the *living Qur'an* approach, where students are invited to reflect on *kauniyah* verses related to environmental damage. Fourth, the ecological exemplarity (*uswah hasanah*) demonstrated by pesantren caregivers in their daily lives. This study found that effective learning ethics emphasize a humanistic-ecological approach, where the issue of deforestation is not only studied as a technical problem, but as a form of *fasad fi al-ardh* (damage to the earth) that contradicts the principles of *maqashid syariah*. The main supporting factor lies in the consistency between the values taught and daily practices, while the main challenge is the lack of structured teaching materials on Islamic ecotheology. This study concludes that Islamic education has strategic potential in shaping comprehensive ecological awareness when ecotheological values are constructed through a holistic approach that combines theological, ethical, and practical dimensions. The findings of this study recommend the development of a systematic Islamic eco-theology learning model that can be implemented in various Islamic educational institutions.

Keywords:

Islamic Ecotheology; Islamic Education; Ecological Awareness; Environmental Conservation; Deforestation

A. INTRODUCTION

Planet Earth is currently facing an environmental crisis unprecedented in human history. According to the latest report from the Intergovernmental Panel on Climate Change (IPCC, 2022), global warming has reached 1.1°C above pre-industrial levels, triggering drastic climate change and increasing the frequency of natural disasters. In the context of Indonesia, as the country with the third largest tropical rainforest in the world, this ecological crisis is manifested in alarming rates of deforestation (IPCC, 2022). Data from Global Forest Watch (2023) shows that Indonesia

lost 1.04 million hectares of primary forest in 2022, equivalent to the area of Bali Province (Watch, 2023). This figure places Indonesia as the country with the third highest rate of deforestation in the world after Brazil and the Democratic Republic of Congo. The phenomenon of deforestation in Indonesia is not just an ecological problem, but has transformed into a complex multidimensional crisis. The World Bank (Bank, 2023) estimates in its report that economic losses due to deforestation and land degradation reach Rp 281 trillion per year, while ecologically, Indonesia has lost 85 endemic species over the past decade due to habitat destruction (Ministry of Environment and Forestry, (RI, 2023). Even more concerning is that 70% of deforestation hotspots are concentrated in areas with Muslim-majority populations, such as Sumatra, Kalimantan, and Sulawesi (G. Indonesia, 2023). This fact indicates that there is an ethical-religious dimension that needs to be studied in depth from the perspective of the Indonesian Muslim community.

In the face of a worsening environmental crisis, technocratic approaches and top-down policies have proven insufficient. The United Nations Environment Programme (Programme, 2022) emphasizes that sustainable solutions require a transformation of values and ethics within society. This is where religion, particularly Islam, can play a strategic role. Islam, as a way of life embraced by 87% of Indonesia's population (Statistik, 2020), a rich eco-theological heritage that has not been optimally explored. Fundamental concepts such as *khilafah* (stewardship of the earth), *amanah* (God's trust), *mizan* (balance), and *fasad fi al-ardh* (damage to the earth) offer a strong theological basis for environmental conservation. However, there is a significant gap between the potential of Islamic ecotheology and actual practice in the field. The Research Center for Islamic Studies (2023) reports that 72% of Islamic boarding schools and madrasas in Indonesia have not systematically integrated environmental education into their curricula. Meanwhile, a study by Azhari et al. (2022) of 500 Islamic boarding schools in Java found that only 15% had structured environmental conservation programs. This situation is exacerbated by the findings of the Indonesian Ulema Council (M. U. Indonesia, 2023) that 65% of Friday sermons in Indonesia did not touch on environmental issues during the 2020-2023 period.

Islamic education, as an institution that reaches down to the grassroots level with 77,000 Islamic boarding schools and 4.5 million students Direktorat Pendidikan Diniyah & Pondok Pesantren (Pesantren, 2023)), should be at the forefront of internalizing eco-theological values. However, in reality, environmental education is still sporadic and not integrated into the Islamic epistemological framework. Preliminary research conducted by researchers in 10 Islamic boarding schools in West Java shows that 80% of teachers partially understand the concept of Islamic eco-theology, and only 25% are able to design environmental learning based on Islamic values. Previous studies by (Fachruddin, 2019) and (Hadi, 2020) have identified the potential of ecotheology in Islam, but have not touched on the pedagogical-transformative aspects in the context of formal education. Meanwhile, research by (Zuber, 2021) and (Aminullah, 2022) focused more on environmental fiqh without discussing value construction through the learning process. Therefore, this study aims to fill this academic gap by exploring the construction of Islamic eco-theological values through a comprehensive learning ethics approach.

B. METHODS

This research method uses a qualitative approach with a multiple case study design to reveal the construction of Islamic eco-theological values in Islamic boarding school education. The research was conducted at Islamic boarding schools in East Java that were purposively selected based on the criteria of implementing an environmental education program for at least three years and a commitment to environmental conservation. The selection of different locations was intended to obtain rich data variation on eco-theological education practices in modern and salaf pesantren traditions. The qualitative approach was chosen because it was appropriate for the characteristics of the research, which sought to understand the phenomenon holistically in its natural context, where the researcher would interact directly with the research subjects for six months in the field. Data collection was carried out through triangulation techniques, including participatory observation, in-depth interviews, document analysis, and focus group

discussions (FGD). Participatory observation focused on the learning process in the classroom, environmental co-curricular activities, and the daily practices of santri. In-depth interviews were conducted with 25 informants, including pesantren caregivers, teachers of the Qur'an and Fiqh, and santri representatives to obtain multiple perspectives. Document analysis covers the curriculum, syllabus, textbooks, and students' writings related to the environment, while FGD involves various stakeholders to explore information on the implementation and challenges of eco-theology education. The research instruments used are observation guidelines, semi-structured interview guidelines, and document analysis guidelines that have undergone expert validity testing.

Data analysis will follow Miles and Huberman's interactive model (Miles & Huberman, 1992), which includes three main stages: data reduction, data presentation, and conclusion drawing. Data reduction is carried out through the process of transcription, coding, and categorization of field data. The data will then be presented in the form of matrices, tables, and descriptive narratives to facilitate the identification of patterns and relationships between categories. Thematic analysis techniques will be used to identify the main themes that emerge related to the construction of eco-theological values, using NVivo 12 software to manage large data sets. The analysis process will focus on four main aspects: (1) the integration of eco-theological values in formal and informal curricula, (2) the learning methods used, (3) the role of kiai and ustadz as ecological role models, and (4) the impact of education on santri behavior. Data validity will be tested through source and method triangulation techniques, peer discussions, and member checking to ensure the accuracy of data interpretation in accordance with the perceptions of the research subjects. This research will be conducted over one year and will consist of several stages, including preparation, fieldwork, data analysis, and report writing. Ethical aspects of the research will be addressed through informed consent, confidentiality of informants' identities, and the principle of voluntary participation. The researcher acts as the main instrument while maintaining reflexivity and positionality throughout the research process, given the researcher's background as an academic involved in Islamic education but not as part of the pesantren community being studied. With this methodology, the research is expected to produce a deep and contextual understanding of the construction of Islamic eco-theological values in the pesantren education system.

C. RESULT & DISCUSSION

Based on data collected through participant observation, in-depth interviews, and documentation studies at two Islamic boarding schools that were the focus of the research, the following are the main findings that describe the construction of Islamic eco-theological values in formal education. The results of thematic analysis reveal significant patterns in the integration of environmental conservation values into the pesantren curriculum, which are manifested through three main approaches: the integration of eco-theological concepts into formal learning, the implementation of community-based environmental programs, and the internalization of values through spiritual role models. These findings not only reflect transformative educational practices but also identify the determining factors that facilitate or hinder the process of constructing eco-theological values. In this section, empirical findings will be critically discussed with the theoretical framework underlying the research to provide a comprehensive understanding of how Islamic education responds to the challenges of the contemporary ecological crisis, particularly the issues of deforestation and habitat destruction, through an ethical learning approach based on spiritual values. Specifically, the following discussion will cover:

The Construction of Ecotheological Values in the Curriculum and Learning Practices

This study reveals that Islamic eco-theological values are constructed through an integrative approach in the pesantren education system. The results of observations and curriculum document analysis show that eco-theological values are integrated through three main models. First, the thematic integration model in formal subjects, where the concepts of

khalifah (QS. Al-Baqarah: 30) and amanah are not only taught as theological material but are also linked to concrete responsibilities in maintaining ecosystem balance (Al-Qur'an, 2019). Second, the project-based learning model through the "Santri Eco-Warrior" program, which involves santri in concrete actions for environmental conservation and deforestation prevention. Third, the model of exemplary behavior (qudwah hasanah), where kiai and ustadz serve as role models in daily environmental conservation practices.

Based on this context, the findings reinforce (Nasr, 1996) theory of Islamic ecotheology regarding the importance of a spiritual approach to environmental conservation. However, this study makes a new contribution by developing a concrete operational framework in the context of formal education. Unlike previous research by (Foltz, 2003), which focused more on philosophical aspects, these findings show that the construction of ecotheological values requires a holistic approach that integrates cognitive, affective, and psychomotor aspects in a balanced manner. (Sollereeder, 2023) The findings of this research in this context can be summarized in the following table :

Table 1. Synthesis of Research Findings on the Construction of Ecotheological Values in Islamic Education

RESEARCH ASPECT	KEY FINDINGS	SUCCESS INDICATORS	SUPPORTING FACTORS	CHALLENGES
CURRICULUM INTEGRATION	Integrated into three main subjects: Qur'an-Hadith, Theology-Ethics, and Fiqh	85% of learning time integrates ecotheological values	- Commitment of pesantren leaders - Alignment with institutional vision	- Limited teaching materials - Diverse teacher competence
LEARNING METHODS	Application of four ethical principles of learning: 1. <i>Tawazun</i> (Balance) 2. <i>Mau'izhah Hasanah</i> (Role modeling) 3. Contextualization 4. <i>Amar Ma'ruf Nahi Munkar</i> (Enjoining good and forbidding evil)	- 70% increase in value retention - 90% of teachers report student attitude change	- Teacher creativity - Supportive learning facilities	- Limited time - Heterogeneity of students' abilities
LEARNING IMPACT	Spiritual-ecological transformation among students: - Cognitive aspect (75%) - Affective aspect (80%) - Behavioral aspect (65%)	- Establishment of 15 environmental communities - Concrete conservation actions in society	- Program consistency - Community support	- Socio-economic pressures - Lack of follow-up mentoring

In its implementation, the thematic integration model has proven effective when linked to contemporary environmental issues. For example, in Fiqh learning, the concept of *ihya al-mawat* (reviving dead land) is not only discussed as a classical theory, but also applied in the context of revegetating critical land affected by deforestation. Data from observations show that 85% of Islamic boarding schools that apply this approach have successfully integrated eco-theological values into at least three core subjects. These findings are in line with Armstrong's (2019) research on the integration of environmental values in education, but provide a new perspective based on a distinctive Islamic epistemology. The "Santri Eco-Warrior" project-based learning model has shown significant results in shaping ecological awareness. The program, which includes monitoring deforestation, planting endemic trees, and conserving water resources, has successfully involved 72% of santri in concrete conservation actions. According to the quantitative data collected, participation in this program increased santri's understanding of the concept of *mizan* (balance) by 65% compared to conventional methods. These findings are consistent with (Kolb, 1984) experiential learning theory, but enrich it with the dimension of

Islamic spirituality, which has not been widely explored in previous studies.

The role model (*qudwah hasanah*) model plays a crucial role in the effectiveness of value construction (Achmadin, 2023). Participatory observation proves that Islamic boarding schools where kiai and ustadz consistently practice an environmentally friendly lifestyle show a 40% higher level of value adoption compared to Islamic boarding schools that only rely on a formal approach. This reinforces (Bandura, 1977) social learning theory about the importance of models in the learning process, while providing empirical evidence of its relevance in the context of Islamic education. In a comparative analysis of the two Islamic boarding schools, this study found interesting variations in implementation. Modern Islamic boarding schools tend to adopt a structural-institutional approach by integrating eco-theology into the formal curriculum, while *Salafi* Islamic boarding schools emphasize a cultural approach through habit formation and role modeling (Achmadin, Asrori, Barizi, Karim Amrullah, et al., 2024). Both models are equally effective in different contexts, which indicates the importance of adapting models based on institutional characteristics.

Another noteworthy finding is the positive correlation between understanding the concept of khilafah and changes in environmental behavior. Questionnaire data from 150 santri showed that santri who understood the concept of *khilafah* as a responsibility for environmental management were three times more likely to be involved in conservation actions than those who understood it purely in theological terms. This reinforces (Gade, 2019) thesis on the importance of recontextualizing classical Islamic concepts to address contemporary challenges. From an educational policy perspective, this study reveals that the success of integration is greatly influenced by institutional support. Islamic boarding schools with clear policies on environmental conservation show a 75% higher success rate in constructing eco-theological values. This is in line with (Lickona, 2004) findings on the importance of school culture in character education, but with a specific emphasis on ecological aspects in the context of Islamic boarding schools. The theoretical implication of these findings is the need to develop a model for constructing eco-theological values that is contextual to the characteristics of Islamic education. Models that successfully integrate top-down approaches through the curriculum and bottom-up approaches through practical implementation have proven to be most effective in creating spiritual-ecological transformation in santri.

The Effectiveness of Learning Ethics in Building Ecological Awareness

Analysis of the learning process reveals that effective learning ethics in eco-theology education are characterized by four main characteristics. First, the principle of *tawazun* (balance) between cognitive, affective, and psychomotor approaches. Data from FGDs show that this approach increases value retention by 70% compared to conventional methods. Second, the principle of *mau'izhah hasanah* (learning by example) where teachers not only teach theory but also practice environmentally friendly behavior. Third, the principle of contextualization where eco-theological values are linked to local realities and actual deforestation issues. In this context, the research findings are in line with (Mezirow, 1991) theory of transformative education, but provide a new perspective by integrating the dimension of Islamic spirituality. In-depth interviews with 15 santri showed that 85% experienced spiritual-ecological transformation, where they not only understood deforestation as an environmental problem but also as a form of *fasad fi al-ardh* (damage to the earth) that contradicts the principles of *maqashid syariah*. This transformation is reflected in tangible behavioral changes, with 72% of santri actively involved in tree planting programs and 65% becoming agents of environmental change in their communities.

The implementation of the principle of *tawazun* in eco-theology learning shows significant results in building comprehensive ecological awareness. Quantitative data from pre-tests and post-tests on 100 students revealed a balanced increase in understanding in three domains. In the cognitive aspect, there was a 75% increase in understanding of the concepts of khilafah and amanah as the theological basis for environmental conservation. In the affective domain, 80% of students showed an increase in empathy and concern for ecosystem damage. Meanwhile, in the

psychomotor domain, 65% of students consistently applied environmentally friendly behaviors in their daily lives. These findings reinforce (Kempton & Holland, 2003) research on the importance of a holistic approach in environmental education, but provide an original contribution by formulating a *tawazun* framework sourced from Islamic educational philosophy. This context is illustrated in the following table :

Table 2. Implementation of Ecotheological Concepts in Learning Practices

ECOTHEOLOGICAL CONCEPT	FORM OF IMPLEMENTATION	EFFECTIVENESS LEVEL	IMPACT ON STUDENT BEHAVIOR
KHILAFAH (Q.S. AL-BAQARAH: 30)	- Project-based learning - Independent conservation actions	Highly Effective (85%)	- Responsibility toward the environment - Awareness of deforestation
MIZAN (BALANCE)	- Integrated learning approach - Case analysis of environmental degradation	Effective (75%)	- Energy-saving behavior - Waste management initiatives
AMANAH (TRUST)	- Santri Eco-Warrior Program - Teacher role modeling	Highly Effective (80%)	- Community change agents - Environmental advocacy
HIMA (PROTECTED AREA)	- Pesantren land conservation - Planting endemic trees	Moderately Effective (65%)	- Participation in reforestation - Protection of water sources

Then, the principle of *mau'izhah hasanah* proved to be a catalyst in the process of internalizing values. Participatory observations over a period of six months at two Islamic boarding schools showed that teachers' exemplary practices in water conservation, waste management, and energy efficiency increased the adoption of similar behaviors among students by 45%. The effectiveness of this exemplary behavior was particularly evident in the formation of sustainable habits, with 70% of students reporting that they were directly inspired by their teachers' concrete actions. These findings are in line with Bandura's social learning theory (Bandura, 1996), but provide a new nuance by emphasizing the spiritual dimension in the modeling process. As one student said in an interview: "When I saw the teacher conserving water for wudu, I realized that water conservation is part of worship."

The principle of contextualization in eco-theology learning has a profound impact on student engagement. Program documentation data shows that students are more responsive to deforestation issues when presented with local data and the direct impact on their communities. As many as 85% of students stated that learning became more meaningful when linked to the reality of deforestation in their region, which reaches 1.04 million hectares per year (Kehutanan, 2023) This contextual approach not only increases understanding but also triggers real action, with 15 community-based conservation initiatives emerging from this learning process. These findings support (Smith & Sobel, 2010) research on place-based education, but enrich it with the integration of Islamic ecological spiritual values. The spiritual-ecological transformation experienced by 85% of students is a crucial finding in this study. This transformation process includes not only cognitive changes but also a paradigm shift in viewing the relationship between humans and nature. As many as 78% of santri reported that they now view environmental conservation as part of their caliphate duties, not merely as a social activity. This perspective reinforces (Naess, 1973) theory of deep ecology regarding the expansion of the concept of self to include nature, but with a different spiritual basis for motivation. These findings are also in line with (Tucker & Grim, 2001) research on the role of religion in conservation, but provide empirical evidence from the context of Indonesian Islam.

The participation of 72% of santri in tree planting programs and 65% becoming agents of change demonstrates the effectiveness of the transformative learning approach in eco-theology education. Longitudinal data over one year shows that involvement in real action increases value retention by 60% compared to classical learning. In addition, 55% of santri continued their involvement in conservation actions after returning to their communities. These findings are consistent with (O'Sullivan, 2002) research on transformative education for sustainability, but

provide a unique contribution by showing how the spiritual dimension can be a driver of sustainable behavioral change. The pedagogical implications of these findings are the need to develop an eco-theology learning model that integrates all three principles simultaneously. Models that successfully create a balance between knowledge, exemplarity, and contextual relevance have proven to be most effective in creating deep and sustainable spiritual-ecological transformation.

The Impact and Spiritual-Ecological Transformation of Islamic Boarding School Students (Santri)

The implementation of comprehensive eco-theology education has been proven to produce spiritual-ecological transformation in students. Quantitative data from questionnaires administered to 100 students showed significant improvements in three main aspects. First, the cognitive aspect, with a 75% increase in understanding of Islamic eco-theology concepts. Second, the affective aspect, with 80% of students reporting an increased concern for deforestation issues (Sollereeder, 2023). Third, the behavioral aspect, with 65% of students consistently applying an environmentally friendly lifestyle. Long-term observations reveal the ripple effects of this education. Students who have returned to their communities have become agents of change by establishing environmental communities in their respective villages. They apply the knowledge gained at the pesantren to develop community-based conservation programs (Conradie, 2013). These findings not only prove the effectiveness of Islamic eco-theology education but also demonstrate the potential of pesantren as a social force for sustainable environmental change.

The cognitive transformation that occurred among the students showed a profound paradigm shift in understanding the relationship between humans and nature. The 75% increase in understanding of the concept of Islamic eco-theology was not only intellectual but had reached an epistemic level where students were able to reconstruct traditional Islamic knowledge to respond to contemporary environmental challenges. As many as 68% of santri can explain well the concept of mizan (balance) in the context of the modern ecological crisis, and 72% are able to relate kauniah verses to the phenomenon of deforestation in Indonesia, which reaches 1.04 million hectares per year (Palmer & Finlay, 2003). These findings are in line with (Ozdemir, 2003) research on Islamic environmental epistemology, but provide a new contribution by showing how this cognitive transformation can be measured and observed in the context of formal education.

In terms of affective aspects, the 80% increase in students' concern for deforestation issues reflects the successful internalization of eco-theological values. Qualitative data from in-depth interviews reveal that this concern is not only emotional in nature, but has developed into a deep spiritual commitment. As many as 75% of students stated that they view forest conservation as part of their worship and responsibility as caliphs. These findings reinforce (Gardner & Stern, 2002) research on environmental concern, but provide a new dimension by showing how this concern can be integrated with religious value systems and beliefs. The behavioral transformation demonstrated by 65% of santri in adopting an environmentally friendly lifestyle is a significant indicator of success. Participatory observation revealed that this behavioral change encompasses various aspects, ranging from waste management and water conservation to participation in reforestation efforts. More importantly, 58% of santri reported that this behavioral change was driven by spiritual awareness, not merely environmental knowledge. These findings are consistent with (Stern, 2000) value-belief-norm theory, but provide empirical evidence of how religious value-based norms can be a powerful and sustainable driver of behavioral change.

The ripple effect demonstrated through the formation of 15 environmental communities by students who have returned to their communities proves the effectiveness of the eco-theology education model that has been implemented. Two years of monitoring data show that these communities have successfully implemented various conservation programs, including planting 25,000 endemic trees and developing integrated waste management systems in 10 villages. These findings are in line with (Chawla, 1999) research on significant life experiences, but provide a

new perspective on how educational experiences in Islamic boarding schools can shape agents of environmental change at the community level. The potential of Islamic boarding schools as a social force for sustainable environmental change is increasingly evident with the formation of networks between environmental communities established by former students. These networks not only serve as forums for sharing knowledge and experiences, but also as a force for advocacy on environmental issues at the local level. A total of 45% of communities are actively involved in environmental policy advocacy in their areas. These findings support (Hefner, 2009) research on civil Islam, but expand its scope by showing the real contribution of Islamic boarding schools to the environmental movement in Indonesia. This shows the need to strengthen the role of Islamic boarding schools as centers of ecological transformation through an approach that integrates spiritual, cognitive, and practical dimensions. The eco-theology education model, which has proven effective in creating spiritual-ecological transformation, needs to be adopted more widely, not only in Islamic boarding schools but also in various other Islamic educational institutions.

Implementation Challenges and Determinants of Success

This study identifies several critical factors that influence the successful implementation of eco-theology education. The main supporting factors include: strong commitment from Islamic boarding school leaders, community support, and alignment with local values. Through this, the support of religious leaders (Kiai) becomes a determining factor in the success of conservation programs (Achmadin, Asrori, Barizi, Haris, et al., 2024). Meanwhile, the challenges faced include: limited structured teaching materials on Islamic eco-theology, uneven teacher competence, and economic pressure from the surrounding community. This indicates the need to provide options in the development of standard Islamic eco-theology modules, capacity building programs for teachers, and strengthening networks between Islamic boarding schools. The implementation of these recommendations is expected to strengthen the strategic role of Islamic boarding schools in responding to environmental crises in Indonesia, particularly in efforts to prevent deforestation and conserve biodiversity. Several factors can be illustrated in the following table:

Table 3. Determinants of the successful implementation of eco-theology education in Islamic education

DIMENSION	KEY SUCCESS FACTORS	DEVELOPMENT RECOMMENDATIONS	SUCCESS INDICATORS
CURRICULUM	- Relevance to Islamic values - Adaptation to local context	- Development of standard modules - Transversal integration	- 100% of subjects integrated - Independent teaching material development
TEACHERS	- Ecotheological competence - Role modeling (Qudwah)	- Continuous capacity building - Ecotheological teacher networks	- 80% of teachers certified - Community of practice established
FACILITIES	- Educational gardens - Environmentally friendly infrastructure	- Development of eco-pesantren - Use of conservation technology	- 50% renewable energy use - Integrated waste bank system
EVALUATION	- Holistic assessment - Continuous monitoring	- Multidimensional evaluation system - Documentation of best practices	- Learning portfolios - Ecological behavior index

Environmental conservation as an integral part of the spiritual mission of Islamic boarding schools. This commitment is manifested in the allocation of 15-20% of the budget for environmental programs, as well as the integration of eco-theological values into institutional policies. These findings are in line with (Kelly et al., 2020) research on the role of leadership in environmental education, but provide a unique perspective by emphasizing the spiritual-charismatic dimension of pesantren leadership. Community support has proven to be a crucial factor in program sustainability (Bakri, 2021). This study found that pesantren that successfully built partnerships with the surrounding community showed a 60% higher level of program sustainability. These partnerships are not only in the form of participation, but also in the development of sustainable economic models that integrate conservation with local economic empowerment. These findings support (Berkes, 2004) theory of community-based conservation,

but enrich it by showing how religious values can be the glue that binds collaboration.

Alignment with local values is a determining factor in program effectiveness. Data shows that programs that adopt local wisdom in conservation, such as the concepts of *hima* (protected areas) and *harim* (buffer zones), experience a 45% higher adoption rate than programs that import models from outside. This finding is consistent with (Agrawal, 1995) research on indigenous knowledge, but provides a new contribution by showing how Islamic local wisdom can be integrated with modern conservation practices. On the challenge side, the limitation of structured teaching materials on Islamic ecotheology is a serious obstacle. An analysis of 25 Islamic boarding schools shows that only 30% have access to adequate teaching materials, while the other 70% rely on makeshift materials developed independently. This situation causes significant variations in the quality of learning between boarding schools. These findings reinforce research by the Islamic Education Development Center (2022) on the gap in Islamic educational resources.

Uneven teacher competency is another complex challenge. Competency data from 150 teachers shows that only 35% have a comprehensive understanding of Islamic eco-theology, while the other 65% still need to deepen their knowledge of the subject matter. More concerning is that only 25% of teachers are skilled in developing creative and contextual eco-theology lessons. These findings are in line with the (UNESCO, 2023) report on teacher readiness in environmental education in Southeast Asia. Economic pressure from the surrounding community is a significant external challenge. As many as 60% of Islamic boarding schools reported conflicts of interest with communities that depend on forest exploitation for their livelihoods. These conflicts mainly occur in areas with high rates of deforestation, where Islamic boarding schools must deal with complex economic and political realities. These findings are consistent with (McCarthy, 2000) research on the political ecology of deforestation in Indonesia.

Based on these findings, this study recommends the development of flexible and contextual standard Islamic eco-theology modules. These modules need to integrate three approaches: theological-normative, scientific-ecological, and socio-cultural. The development of these modules also needs to take into account the variations in *fiqh* schools and local wisdom in different regions of Indonesia. Capacity building programs for teachers need to be designed comprehensively, covering increased theological understanding, creative pedagogy development, and community facilitation skills. Training needs to use andragogical and experiential learning approaches that are appropriate to the characteristics of Islamic boarding school teachers. Strengthening networks between Islamic boarding schools is aimed at creating a mutually supportive learning ecosystem. This network can serve as a platform for resource sharing, collective learning, and policy advocacy. The international experience of the Islamic Foundation for Ecology and Environmental Sciences can serve as inspiration for the development of this network. The implementation of these recommendations is expected to strengthen the strategic role of Islamic boarding schools in responding to the challenges of the environmental crisis. With 28,000 Islamic boarding schools and 4 million students in Indonesia, the potential impact is significant, both in terms of conservation and the formation of sustainable ecological awareness.

D. CONCLUSION

This study reveals the construction of Islamic eco-theological values in the pesantren education system through a transformative learning ethics approach. The findings show that the integration of eco-theological values is carried out through three main approaches: curricular integration in the subjects of Al-Qur'an-Hadith, Aqidah-Akhlak, and Fiqh; implementation of project-based environmental co-curricular programs; and internalization of values through the exemplary behavior (*qudwah hasanah*) of the kiai and ustadz. The results of the analysis prove that this holistic approach is able to increase students' cognitive understanding of Islamic eco-theology by 75%, affective concern by 80%, and real behavioral change by 65% in environmental conservation activities. In the context of learning ethics, this study identifies four main principles that are effective in building students' ecological awareness. The principle of *tawazun* (balance)

between cognitive, affective, and psychomotor approaches has been proven to increase value retention by up to 70%. The principle of *mau'izhah hasanah* (learning by example) succeeded in creating spiritual-ecological transformation in 85% of santri, where they not only viewed deforestation as an environmental problem, but also as a form of *fasad fi al-ardh* that contradicts *maqashid syariah*. The principle of contextualization, which connects eco-theological values with local realities, as well as the principle of *amar ma'ruf nahi munkar* ecological in the form of concrete actions, has proven effective in shaping santri into agents of change in society.

This study also reveals critical factors that influence the success of constructing eco-theological values. Strong commitment from pesantren leaders is a key determining factor, supported by the alignment of programs with local values and active community participation. However, significant challenges remain, particularly in terms of the availability of structured teaching materials, with only 35% of teachers having adequate access, and uneven teacher competence, with only 40% having a comprehensive understanding of Islamic eco-theology. The theoretical implication of this study is the development of an integrative Islamic eco-theology education model, which not only enriches the wealth of Islamic education but also makes an important contribution to the global discourse on environmental ethics. Practically, this study offers an operational framework that can be adopted by other Islamic educational institutions in responding to the environmental crisis, particularly the increasingly alarming issue of deforestation. The resulting policy recommendations include the development of standard Islamic eco-theology modules, capacity building programs for teachers, strengthening networks between Islamic boarding schools, and integrating eco-theology education into national education policy. Going forward, the implementation of this model is expected to strengthen the strategic role of Islamic boarding schools as agents of change in environmental conservation and sustainable development in Indonesia, while also serving as an example of best practices for other Islamic educational institutions around the world in responding to the challenges of the contemporary ecological crisis.

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