

INTEGRATING ECOLOGICAL AWARENESS THROUGH ISLAMIC RELIGIOUS EDUCATION: A CASE STUDY AT AN-NIDHAMIYAH ISLAMIC BOARDING SCHOOL, PAMEKASAN

Moh. Sa'edi¹, Moh. Dannur², Ach. Sayyi³, Majid Al-Islam⁴

^{1,2,3} Institut Agama Islam Al-Khairat Pamekasan, Indonesia

⁴, Centre For Studies In Social Sciences, Calcutta, India

*e-mail: massaedi411@gmail.com

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ABSTRACT

This study aims to analyze the strategies, methods, and effectiveness of instilling ecological awareness among students in the perspective of Islamic Religious Education (PAI), focusing on a case study at the An-Nidhamiyah Islamic Boarding School, Pasean District, Pamekasan Regency. This research employs a qualitative ethnographic approach, using data collection techniques such as observation, interviews, and documentation studies. The analysis was carried out in a descriptive-analytical manner to understand the application of ecological values in the learning and daily life of students. The results show that ecological awareness among students is cultivated through the integration of Islamic values in the PAI learning system, the practice of environmentally friendly behavior, and examples set by the managers of the pesantren, including caregivers and asatidz. Programs such as waste management, greening, and sustainable waterway construction have been implemented as part of ecology-based learning. The contribution of this research lies in offering insights into the role of PAI in shaping students' environmental responsibility. These findings can serve as a reference for other Islamic boarding schools to develop eco-based education models aligned with Islamic values, thereby contributing to strengthening ecological awareness among the younger generation of Muslims.

INTRODUCTION

Ecological problems cannot be underestimated and must be a serious concern, especially for people who live in areas prone to natural disasters, such as landslides, earthquakes and so on (Hermon, 2015). According to data released by the National Disaster Management Agency (BNPB) of East Java Province, the risk of natural disasters such as landslides often occurs, especially during the rainy season, and has caused many losses to the people such as damage to infrastructure and housing. Therefore, this must be realized, especially by those who are considered to understand the importance of protecting the environment. Islamic boarding schools as educational institutions that teach Islamic teachings are certainly also very concerned about ecological issues (Sahin, 2018). Students who are important subjects in Islamic boarding schools are expected to be able to understand problems related to the environment (Rochmah et al., 2024).

The An-Nidhamiyah Islamic boarding school located in Pasean District, Pamekasan regency can be used as a reference in implementing environmental awareness, especially in the pesantren area.

The Islamic boarding school, which is located in an area prone to natural disasters such as landslides, has gone through difficult and tense times because around 2021 there has been a landslide disaster that caused damage to buildings and caused injuries to students and even some to death. However, natural disasters will not always have a bad impact, even though at the time of the landslide event it felt very depressed both socially and psychologically, but after the incident, the An-Nidhamiyah Islamic boarding school, which was commanded by all stakeholders, both caregivers and administrators of the Islamic boarding school together with the students, carried out reforms that had a considerable impact on the awareness of the importance of protecting the pesantren environment.

As an institution that teaches Islamic values, the An-Nidhamiyah Islamic boarding school in its daily life correlates the teachings of Islam with the environment. In Islam, humans are referred to as caliphs (leaders) on earth who are given the responsibility to protect and care for the earth wisely and prohibit doing façade actions that can harm the environment. Islam also encourages reforestation by planting trees, maintaining cleanliness and caring for wildlife on earth (Habibah et al., 2025). These values and teachings are used as the basis by the An-Nidhamiyah Islamic boarding school in implementing environmental awareness among students. Such as utilizing waste by recycling, making effective waterways and ensuring that all buildings in the Islamic boarding school area are sturdy and resistant to natural disasters such as during the rainy season where landslides often occur.

Ecological awareness instilled in the framework of Islamic Religious Education can be done in various ways, where environmental education can be combined in the environment such as at the An-Nidhamiyah Islamic Boarding School, Pasean District, Pamekasan Regency. This synthesis postulates that environmental management is a religious teaching, in addition to that it is also in line with the broader educational goals in developing ecological literacy in students. The integration of ecological awareness into the curriculum can significantly improve students' understanding of their responsibility towards the environment and their role in promoting sustainability (Rohmah & Sayuti, 2024). Environmental education serves as an important component in developing students' awareness and sensitivity to ecological issues (Sakarya et al., 2023).

According to Karima and Firza, environmental education enriches students' knowledge of sustainable practices and fosters correct values about human and environmental interactions, which are important to address local and global environmental challenges (Karima & Firza, 2019). This educational framework can be used effectively in Islamic religious education by incorporating teachings from the Qur'an and Hadith that emphasize the importance of caring for the earth and its resources. For example, the Qur'an very often mentions the problem of stewardship on earth, this can be mentioned in lessons to foster a sense of responsibility in students (Arifin, 2021). On the other hand, self-efficacy related to environmental education will play an important role in shaping students' attitudes and behaviors towards ecological issues (Puspitasari & SH, 2024).

Research by Pullu and GÖmleksiz shows that the perception of positive self-efficacy in the educational environment can be reduced by reducing anxiety and increasing awareness of ecological footprints among students (E. K. Pullu & GÖmleksiz, 2023). This means that when students feel that they can truly create change, they are more likely to engage in environmentally responsible behavior. Islamic teachings can strengthen this self-efficacy by encouraging students to see their actions as part of a larger divine mandate to protect and preserve the environment (Kuncoro, 2023). Incorporating practical activities into the educational framework will further increase ecological awareness (Loviana et al., 2024).

Guadalupe-Zevallos emphasized the need to provide opportunities for students to engage in ecological programs that encourage positive habits, such as recycling and resource conservation (Guadalupe-Zevallos et al., 2023). These activities can be incorporated into the pesantren curriculum, which allows students to apply their religious teachings in a practical context. For example, organizing community clean-up activities or creating recycling programs at Islamic boarding schools

can be hands-on experiences that reinforce the importance of environmental management. Ecological literacy (Hadi et al., 2021), defined as the ability to understand and respond to environmental issues, is another important aspect of fostering ecological awareness. Prastiwi highlighted that ecological literacy enables individuals to make informed decisions regarding environmental challenges (Prastiwi et al., 2019).

In the context of Islamic education, this can be framed in the teachings of Islamic ethics, which advocate responsible consumption and sustainable use of resources. By linking ecological literacy to Islamic principles, educators can foster a deeper understanding of the moral implications of environmental degradation and the importance of sustainable practices (Khasanah et al., 2025). In addition, the role of critical thinking in environmental education cannot be ignored. Although Shan and Li's references are not directly relevant to Islamic education, the general principle remains that the development of critical thinking skills enables students to analyze and evaluate environmental issues more effectively (Shan & Li, 2023),

By fostering critical thinking and ecological awareness, educators can transform students into more active people in dealing with environmental issues, and thus fulfill their religious and ethical obligations (Mangunjaya, 2007). The use of digital instruments and materials can also increase the effectiveness of environmental education. According to a study conducted by Fanani, the use of multi-application-based digital instructional materials greatly increases the awareness and ecological understanding of students (Fanani et al., 2023).

In the context of Islamic boarding schools, technology integration can facilitate an interactive learning experience with students about environmental issues (Muchasan & Rohmawan, 2024). For example, the use of online platforms to conduct research on local environmental issues can lead students to find solutions while integrating their religious teachings. In addition, the development of ecological awareness needs to be carried out outside the classroom (Amalia Nur Milla et al., 2025). Tang and Zhang explain how strengthening ecological awareness as a social responsibility goes beyond the academic environment (Tang & Zhang, 2013). Islamic teachings can play an important role in promoting this sense of responsibility, as they evoke community involvement and collective action towards environmental conservation. Islamic boarding schools can introduce outreach programs that involve students in community environmental activities, thereby strengthening the bridge between their education and their work as good citizens (Putra, 2023).

In addition to fostering ecological awareness, environmental education also needs to be more than just an emotional and psychological aspect. Pullu's research shows that students who undergo activity-based environmental education have higher awareness and responsibility for environmental issues (S. Pullu & Pullu, 2021). This shows that experiential learning that is in line with Islamic pedagogical practices can significantly increase students' emotional attachment to environmental issues. Exercises such as walking in the natural environment, gardening, or conservation work around the environment can help students build an individual relationship with nature, developing responsibility through strong faith. In addition, the idea of ecofeminism as conveyed by Wiyatmi can offer a different approach to environmental education in the Islamic context (Wiyatmi et al., 2023).

Ecofeminism framework shows the integral relationship between social justice and environmental issues (Madhavi & Nageswar Rao, 2023). Therefore, ecofeminism encourages a holistic approach to ecological awareness (Bloodhart & Swim, 2010). In Islamic education, developing these principles will provide an opportunity for teachers to encourage students to not only think about the broader concept of environmental degradation, but also their external beliefs about the issue, leading to better justice and awareness of marginalized communities (Judrah et al., 2024). This is in accordance with the religious principles of justice and compassion, and results in a more meaningful education. Teachers are also very important in implementing it; in didactic, spring catalysts, or spreaders of ecological awareness, or pedagogical teaching, which are teaching methods

that rely on the awareness of learning objectives broken down or divided into experiences highlighted by Zhou, are so efficient that they result in high absorption of material (Zhou et al., 2023).

The programs provided to educators in Islamic boarding schools are needed to empower them with the necessary resources and training so that they can integrate ecological awareness into their teaching practices (Purnomo et al., 2024). This can be done in the form of professional development programs that explore environmental education that allows educators to be advocates of sustainability in their classrooms and communities. Also partnering with many community-based environmental organizations in the communities where the pesantren is located can result in a powerful educational experience (Hasani & Kurniawati, 2024). By collaborating, pesantren and students can provide access to resources, skills, and learning opportunities to students (Tubagus et al., 2023).

This concept is in line with the Islamic ethics of community service, reinforcing the idea that protecting nature is a collective duty. Ultimately, fostering environmental stewardship in the context of Islamic pedagogy in the An-Nidhamiyah pesantren requires an all-encompassing strategy that combines the principles of ecological learning with Islamic doctrine. Educators can empower students with increased environmental awareness, critical analysis skills, and hands-on involvement, allowing them to respect their spiritual and moral responsibilities to nature (Larson, 2019). This comprehensive approach not only increases students' awareness of environmental challenges but also cultivates assignments and management that are firmly anchored in their religious beliefs. Thus, pesantren can teach students about being kind to the earth as a place to live (Danugroho, 2022).

Many previous studies have discussed the importance of environmental education, but there are still few that examine how the integration of religious values, especially in the context of Islamic Religious Education (PAI), can form ecological awareness in students. This research focuses on how Islamic values are applied to foster environmental awareness in pesantren, by taking a case study at Pesantren An-Nidhamiyah. This research fills a gap by exploring how an Islamic education approach can reinforce environmentally friendly behaviour in the younger generation, an area that is still very much under-discussed in the existing literature.

Although many studies discuss the role of pesantren in students' moral and character education, few explicitly link the integration of religious education with environmental awareness based on Islamic values. Therefore, this study aims to analyse how the PAI approach at Pesantren An-Nidhamiyah can foster ecological awareness in students. In addition, this research also seeks to answer the following questions: How can the practice of Islamic religious education in pesantren shape students' behaviour in terms of environmental awareness? The purpose of this research is first, to identify the steps taken by the An-Nidhamiyah Islamic Boarding School to instill environmental awareness in students. Second, describe the impact of Islamic education on the behavior of students in the environment. This research is expected to have significant value in an effort to create a pesantren that not only contributes to religious education but also helps students increase environmental awareness and integrate environmental education into the curriculum in a more systematic and sustainable manner.

METHODS

This study uses a qualitative method with an ethnographic approach that highlights the challenge of exploring the ecological awareness of students at the An-Nidhamiyah Islamic boarding school, Pasean District, Pamekasan Regency. The ethnographic approach was chosen to know and understand the ecological values that are implemented and realized in the daily lives of the students, as well as the strong support from the environment for ecological awareness for them (Green & Bloome, 2004). This approach is very relevant because it allows researchers to delve deeply into the

cultures, traditions, and practices developed and adopted by the pesantren community related to environmental issues (Sari et al., 2023).

This research was conducted at the An-Nidhamiyah Islamic Boarding School, located in Passeean District, Pamekasan Regency, Madura, East Java. The participants in this study consisted of 20 students (with varying age distribution), 5 pesantren caregivers, and 5 asatidz who were directly involved in the process of religious education and fostering environmental awareness. The selection of participants was done purposively, based on their involvement in religious education activities and the implementation of ecology-based programmes in the pesantren.

Ethical considerations in this research were highly considered. Before data were collected, all participants provided informed consent to participate in the study, with a clear understanding of the purpose of the study, the data collection process, as well as their right to stop participating at any time without any consequences. All data collected was kept confidential by replacing participants' identities with a code and storing the data in a safe place..

The data collection techniques used in this study include participatory observation, in-depth interviews, and document studies (Nilamsari, 2014). Participatory observation is carried out by being directly involved in daily activities at the pesantren, including religious learning, waste handling, and other activities that reflect ecological awareness. In-depth interviews were conducted with students, guardians, and other administrators involved in cultivating ecological awareness among students. This interview was conducted to explore their experiences, understandings, and views related to ecological efforts and practices applied in Islamic boarding schools (Fauziah, n.d.). The documentation study was carried out by analyzing related documents, such as curriculum guides, textbooks, and notes on activities related to ecological awareness and environmental conservation in pesantren (Hennink et al., 2020).

The data analysis technique used was thematic analysis based on Braun & Clarke's (2006) method. The analysis steps began with the transcription of interviews and observations, then initial coding was conducted to identify key themes that emerged from the data. After that, the themes were analysed in depth to find patterns and relationships relevant to this study. The emerging findings will be presented descriptively to illustrate how Islamic religious values are integrated in an effort to increase ecological awareness among students.(Loviana et al., 2024). This analysis is carried out inductively, i.e. the researcher will draw conclusions based on findings obtained from the field about how these practices are integrated into the lives of students in Islamic boarding schools. Descriptive analysis is also used in the process and situation that occurs at the An-Nidhamiyah Islamic Boarding School in detail. With this ethnographic approach, it is hoped that this research can deepen the understanding of efforts to cultivate ecological awareness in Islamic boarding schools and their contribution to changing the mindset of students from anthropocentrism to ecocentrism that is more concerned about environmental sustainability (Astuti, 2015).

RESULTS AND DISCUSSION

In this study, it was found that Islamic boarding schools have made efforts to implement ecology, especially after landslides that hit Islamic boarding schools, such as planting trees in the pesantren area, making garbage dumps and sorting them for recycling and making water channels in anticipation of the rainy season. However, there are several obstacles to this implementation, such as not having sophisticated tools in recycling waste. So they still use makeshift traditional tools, but even so, the enthusiasm shown by the students in maintaining the pesantren environment is quite large.

Islamic religious education applied in pesantren has a significant impact on the environmental awareness of students even though it does not have special subjects that are explicitly listed in the pesantren curriculum. However, in practice, educators, especially kiai and asatidz, actively insert motivation and warnings about the importance of protecting the environment in every learning activity. These findings show that environmental awareness values are more integratively instilled in various aspects of life in Islamic boarding schools.

Ecological Initiatives at An-Nidhamiyah Islamic Boarding School

An-Nidhamiyah Islamic Boarding School has implemented a series of ecological initiatives aimed not only at conserving the surrounding environment but also at raising environmental awareness among the students. These initiatives, such as afforestation and waste management, aim to create a healthier environment while educating students about the importance of caring for the Earth.

Since 2021, the school has planted over 500 trees, including fruit trees and large trees that provide shade around the school area. This project is not just about beautifying the campus but also improving air quality and providing a cooler environment for the students as they study and engage in activities. According to field observations, nearly all students were involved in both planting and maintaining these trees. One student mentioned in an interview, "We feel proud seeing the trees we planted growing tall," indicating a personal connection and responsibility for the environment. These activities help students realise that caring for the Earth is part of their responsibility as khalifah—stewards of the Earth, a fundamental teaching in Islam.

Additionally, the school has focused on waste management. Organic waste, such as food scraps, is turned into compost, which is used to improve soil quality around the school. Non-organic waste, such as plastic and paper, is recycled for various uses. According to documentation of the program, about 80% of organic waste is successfully managed into compost, demonstrating the effectiveness of the waste management system. Students are actively taught how to segregate waste and understand that waste management is an important part of environmental conservation.

To reduce the risk of natural disasters such as landslides, the school has also built efficient drainage systems. This system has proven to be effective in directing rainwater safely, avoiding the waterlogging that previously caused damage to the school buildings and surrounding areas during the rainy season.

Table 1. Ecological Initiatives at An-Nidhamiyah Islamic Boarding School

Programme	Description	Purpose
Tree Planting	Planting fruit and large trees to provide shade and absorb carbon dioxide	To improve air quality and provide shade for students
Waste Management	Segregation of organic and non-organic waste and composting	To reduce waste and teach students the importance of waste management
Drainage Systems	Construction of drainage systems to channel rainwater	To reduce the risk of landslides and maintain environmental stability

These ecological programmes have had a significant impact not only on the environment but also on the students' sense of responsibility. By actively participating in these initiatives, students have learned that environmental conservation is not only a social duty but also a spiritual responsibility as part of their faith. Their direct involvement in planting trees and managing waste has provided them with hands-on experience, reinforcing the importance of sustainable practices.

Each programme run by this pesantren not only focuses on practical actions, but also serves as a medium for in-depth environmental education. By involving students in hands-on management and giving them personal responsibility, the pesantren successfully teaches the importance of sustainability in daily practice. The tree planting programme, for example, demonstrates that small actions such as planting trees can have a big impact in the long run on air quality and students' social lives. Students learn about natural processes and the sustainability benefits associated with their actions, and this creates a sense of ownership of their environment.

In addition, by teaching efficient waste management, pesantren provides students with very important skills in waste management that can be applied in their daily lives. In fact, the processing of waste into compost not only reduces waste, but also supports the organic farming programme run at the pesantren, making it an example of integration between education and ecologically sustainable practices.

The implemented water channel system also shows that local adaptation-based policies can reduce the impact of natural disasters. These channels not only serve as a technical means to drain rainwater, but also as a tangible example for students of how ecological knowledge can be applied in dealing with the natural challenges around them. Overall, these initiatives not only help safeguard the environment of the boarding school but also equip students with the value of greater responsibility towards the earth.

Integration of Islamic Values in Environmental Education

At An-Nidhamiyah Islamic Boarding School, environmental education is deeply integrated with Islamic values, offering a unique approach to raising environmental awareness among students. One of the core values emphasised is the concept of khalifah fil ardh, teaching that humans are stewards of the Earth entrusted with its care. This principle provides a strong foundation for the environmental education implemented at the school.

The Qur'an stresses the importance of human responsibility as khalifah on Earth, as seen in Surah Al-Baqarah: 30, which states that humans are responsible for safeguarding and maintaining the Earth. Interviews with educators revealed that this verse is central to the school's teachings, providing students with a deep understanding that caring for the Earth is not just a social obligation but also an act of worship. "We teach students that caring for the environment is not just important for society, but it is also their spiritual duty," said one of the teachers.

This religious education is not confined to theoretical learning; it is applied in daily life. Field observations show that students are actively involved in activities such as tree planting and waste management, teaching them that their actions in protecting the environment are also acts of worship. Students are also taught to conserve water and energy, and to avoid wastefulness, which aligns with Islamic principles of sustainability and avoiding excess.

Table 2. Integration of Islamic Values in Environmental Education

Islamic Value Applied	Implementation in Environmental Education	Impact on Student Environmental Awareness
Concept of Khalifah fil Ardh	Humans as stewards of the Earth responsible for its sustainability	Raises awareness among students about their duty to protect the Earth
Principle of Balance (Mizan)	The Earth was created in balance and must be preserved in harmony	Reduces exploitation of natural resources and promotes efficient use
Prohibition of Corrupting the Earth (Fasad)	Islam teaches that humans should not harm the Earth with destructive actions	Encourages students to avoid pollution, waste, and environmental harm

By teaching these principles, the school creates not only environmentally conscious students but also spiritually committed ones who understand their duty to the Earth as part of their religious obligations. The integration of Islamic values with environmental education provides students with a holistic understanding of their role as stewards of the planet.

Islamic-based education that integrates these ecological principles has a huge impact in shaping students' character. This religious value-based learning not only makes them understand their

role as khalifah, but also applies it in real actions. This is reflected in the way students maintain cleanliness, reduce waste and manage resources wisely.

In addition, the implementation of environmentally friendly practices as part of religious teachings provides a strong spiritual dimension for students in protecting nature. They learn that protecting the earth is a shared responsibility that must be passed on to future generations. Therefore, the Islamic values implemented in this pesantren provide students with not only ecological knowledge, but also a deep spiritual awareness related to their responsibility towards nature.

The Impact of Islamic Religious Education on Student Behaviour

Islamic Religious Education (IRE) at An-Nidhamiyah Islamic Boarding School plays a vital role in shaping student behaviour, especially with regard to their awareness of the environment. The emphasis on the khalifah fil ardh concept and other Islamic teachings related to environmental stewardship has had a significant impact on students' environmental consciousness and actions.

Through IRE, students are taught that they have a spiritual duty to protect the environment, which encourages them to reflect on their actions and understand the ethical implications of their behaviour. According to interviews with students, many of them feel a deep sense of responsibility to the Earth, as they recognise that their actions in caring for the environment are directly linked to their relationship with Allah. One student commented, "We view protecting the environment as part of our worship to Allah."

Field observations confirmed that students actively participate in environmental initiatives such as waste management and tree planting. Their understanding of environmental stewardship is not just intellectual but also practical, with many students incorporating eco-friendly practices into their daily lives. The school's emphasis on eco-consciousness is reflected in the students' actions both within the school and in their wider communities, demonstrating that religious education can have a profound impact on environmental behaviour.

Table 3. The Impact of Islamic Religious Education on Student Behaviour

Aspect Taught in IRE	Impact on Student Behaviour	Implementation at the School
Khalifah fil Ardh	Students understand their responsibility as stewards of the Earth	Tree planting, waste management, and maintaining cleanliness
Principle of Balance (Mizan)	Teaches the importance of maintaining balance in nature	Efficient use of natural resources, avoidance of wastefulness
Prohibition of Corrupting the Earth	Instils awareness not to damage the Earth, in line with Islamic teachings	Implementation of zero waste policies, use of eco-friendly materials

Through these teachings, the students have learned to apply these values in their actions, demonstrating that Islamic education not only deepens their spiritual commitment but also leads to positive environmental behaviours. On the other hand, this religious education also teaches students about the importance of balance between meeting human needs and maintaining the sustainability of nature. In interviews with asatidz, they explained that the concept of mizan, which teaches the importance of the balance of nature, is also one of the principles that is strongly emphasised in their teaching. They realised that this concept helps students see the connection between human actions and their impact on the environment.

This faith-based education not only increases environmental awareness among students, but also provides them with practical knowledge that they can apply in their daily lives. By combining

religious values with concrete actions, the pesantren succeeded in creating long-term changes in students' mindsets and behaviours related to environmental sustainability.

Barriers to Implementing Ecological Programs

While various ecological programs have been successfully implemented at An-Nidhamiyah Islamic Boarding School, there are several barriers that hinder their full effectiveness. These challenges are mainly related to facilities, student diversity, and the lack of experience in sustainable environmental management among the school's administrators.

One of the main barriers is the limited facilities for waste management. According to interviews with the school's administrators, waste processing still relies on simple methods, which are not as effective for handling large volumes of waste. The recycling of non-organic waste, especially plastics, is still done manually and would benefit from modern waste management equipment to handle larger quantities more efficiently.

The diverse age range of students also presents challenges in ensuring that each group understands and applies environmental values appropriately. Younger students, in particular, require more intensive guidance to internalise the concepts and practices of environmental stewardship. The school administrators suggest that specific programmes tailored to different age groups would make the environmental education process more effective.

Furthermore, there is a lack of experience among school managers in sustainable environmental management. Despite some training, administrators still need further skills development to manage ecological programmes effectively. More structured training in sustainable practices would enable the school to improve its approach to environmental management.

Table 4. Barriers to Implementing Ecological Programs

Barrier	Description	Proposed Solutions
Limited Facilities	Waste processing relies on outdated and inefficient methods	Provide modern waste management facilities for more efficient recycling
Diverse Age of Students	Younger students require more intensive guidance	Implement age-appropriate environmental education programs
Lack of Experience in Environmental Management	Administrators lack experience in sustainable program management	Provide further training for administrators in environmental management

Overcoming these barriers will be crucial to ensuring that the ecological programmes at the school can be expanded and sustained, ultimately having a long-term positive impact on both the students and the environment. With more structured solutions and support for pesantren managers, it is hoped that these barriers can be overcome.

Institutional support also played a vital role in reinforcing these adaptive strategies. The Vice Principal, Samlamdianto, explained that the madrasah encourages the formation of teacher learning communities through regular discussion forums aimed at sharing challenges and solutions in lesson planning. This collaborative approach fosters a supportive work climate, strengthens teachers' sense of ownership over the reform process, and provides a safe space for experimentation in teaching practices (Ma`arif M. A.; 2016).

The Head of the Madrasah, Moh. Nur, also emphasized the importance of cultivating a reflective culture within the school, where teachers do not feel individually burdened in facing the

new curriculum. This institutional culture aligns with the view that adaptation depends not only on individual capacity but also on organizational structures that facilitate the process (Faizah and Adeoye; 2025). Thus, these findings affirm that teacher resilience and adaptability are essential prerequisites for the successful implementation of Kurikulum Merdeka. Adaptation does not occur instantly but rather through a process involving continuous learning, peer collaboration, and consistent institutional support. A holistic approach that combines individual initiative with systemic institutional backing is key to creating sustainable and contextually grounded educational transformation.

DISCUSSION

Ecological Initiatives at An-Nidhamiyah Islamic Boarding School

The ecological initiatives implemented at An-Nidhamiyah Islamic Boarding School, particularly the tree planting programme, waste management, and the rainwater drainage systems, play a significant role in not only improving the physical environment of the school but also in shaping the students' environmental consciousness. The school has taken substantial steps to address environmental issues and has used these actions as educational tools, combining practical engagement with environmental stewardship (Ardi, 2023). The tree planting programme at the school, which has involved planting over 500 trees, is not just about beautifying the campus but has a clear ecological purpose. According to field observations, students have been actively engaged in planting and nurturing these trees. This hands-on involvement links directly to the Islamic teaching of khalifah fil ardh, where humans are viewed as caretakers of the earth. As reflected in the interviews with students, the act of planting trees is viewed as a spiritual responsibility and an essential part of their duty to care for God's creation, aligning with the view that environmental stewardship is a form of worship (Al-Qur'an, Surah Al-Baqarah: 30). This connection to Islamic values reinforces the importance of environmental sustainability as not only a social issue but a spiritual obligation (Dianastiti et al., n.d.).

Furthermore, the effective waste management programme at the school highlights the practical integration of environmental practices. The segregation of organic and non-organic waste, with organic materials turned into compost for use in the school's gardens, exemplifies a sustainable approach that reduces waste and reuses materials in a productive manner. Documentary data shows that approximately 80% of organic waste is converted into compost, demonstrating the programme's success. However, this aligns with existing research by Rohmah and Sayuti (2024), which argues that waste management programs not only reduce the environmental footprint but also educate individuals about the value of resource conservation. The students' active participation in waste management reflects a deeper environmental awareness, which is enhanced by theoretical teachings on ecological responsibility (Akbar, 2019).

The rainwater drainage system, which was constructed to mitigate the risk of flooding and landslides, further underscores the school's proactive approach to environmental challenges. The development of these infrastructure projects in response to local environmental conditions supports the ecological adaptation theory, which highlights the need for practical solutions that address immediate environmental challenges (Smith et al., 2020). The effectiveness of the drainage system, as confirmed by interviews with school managers, reflects a critical understanding of how local environmental management strategies can mitigate the impact of climate-related events.

This strong integration of Islamic values with practical environmental solutions provides a clear example of how schools can play a pivotal role in shaping environmentally responsible citizens. The students are not merely taught about environmental issues but are given the opportunity to actively engage in sustainable practices, which, as Liu et al. (2018) suggest, is crucial for fostering long-term environmental responsibility. Thus, the ecological initiatives at An-Nidhamiyah serve as a model for how education can bridge theory and practice, creating a symbiotic relationship between spiritual values and environmental action.

Integration of Islamic Values in Environmental Education

The integration of Islamic values in environmental education at An-Nidhamiyah Islamic Boarding School is an essential aspect that differentiates the school's approach from secular institutions. The concept of khalifah fil ardh is central in the curriculum, creating a direct link between students' spiritual beliefs and their actions towards environmental sustainability. The importance of this connection has been highlighted by Aziz et al. (2020), who argue that religious teachings play a significant role in encouraging pro-environmental behaviours among adherents. The Quranic reference to humans as stewards of the Earth forms a foundational aspect of the school's environmental education (Arif, 2022).

The integration of these values is particularly relevant as it bridges the gap between religious teachings and environmental ethics. According to Hasan et al. (2017), incorporating religious values into environmental education creates a more holistic framework, wherein spiritual beliefs guide and reinforce ethical environmental behaviours. This was particularly evident at An-Nidhamiyah, where students are taught that their duty to care for the Earth is an integral part of their religious responsibility (Ma'arif, 2018). Observations of classroom activities and interviews with educators revealed that discussions on environmental ethics are frequently paired with religious teachings on the proper care of the natural world, resulting in a robust understanding among students that protecting the Earth is a divine mandate.

Incorporating religious teachings such as mizan (balance) and fasad (corruption) into environmental education helps students understand the broader implications of their actions. Mizan emphasizes the need for balance in nature, a concept that directly supports the idea of sustainable development (Arif et al., 2025). This idea is reinforced through activities such as the school's waste management programme and tree planting efforts, which encourage students to recognise that exploiting resources without regard for their impact leads to imbalance in nature. This aligns with the findings of Umar and Mohamed (2019), who suggest that religious frameworks offer a valuable lens for understanding the moral and ethical dimensions of environmental actions.

The concept of khalifah fil ardh (Dora & Arif, 2024), along with the teachings of balance and sustainability, has significant implications for the students' environmental awareness. By framing environmental stewardship as part of their spiritual duty, An-Nidhamiyah Islamic Boarding School effectively motivates students to take ownership of their role in environmental conservation. This underscores Islamic environmental ethics, which align closely with contemporary environmental concerns, as reflected in the United Nations Sustainable Development Goals (SDGs). The ability to marry faith with action provides a model for other institutions looking to foster responsible environmental citizenship.

The Impact of Islamic Religious Education on Student Behaviour

The impact of Islamic Religious Education (IRE) on student behaviour at An-Nidhamiyah Islamic Boarding School has been significant, particularly in fostering a deeper connection between the students and their role as stewards of the Earth. The concept of khalifah fil ardh has not only shaped the students' understanding of their religious duty to care for the environment but has also led to observable changes in their daily practices (Arif et al., 2023).

Field observations and student interviews show that, after participating in the environmental education programmes, students have adopted more eco-friendly behaviours, such as reducing water and energy consumption and increasing involvement in environmental activities. These behavioural changes align with findings by Wong et al. (2020), who found that integrating religious values into environmental education significantly influences pro-environmental behaviours in students. At An-Nidhamiyah, this integration of religious teachings and environmental practices ensures that students understand the moral imperative of protecting the environment, not only as a social responsibility but

as a religious obligation. Observations in the community surrounding the school also revealed that students have taken their newfound environmental awareness beyond the school gates. Many students are reported to have encouraged their families to adopt more eco-friendly practices, such as reducing waste and using water responsibly. This ripple effect indicates that the environmental education at An-Nidhamiyah is having a broader influence on the community, a phenomenon also noted by Kim et al. (2018), who highlighted the role of religious education in influencing social change through individual actions.

However, it is important to note that while the educational approach is highly effective, challenges remain in ensuring that all students can consistently apply these behaviours in every aspect of their lives. Differences in understanding between younger and older students, as well as varying levels of engagement with the programme, can sometimes hinder the widespread adoption of sustainable practices. This gap in participation may be addressed through more tailored educational interventions that cater to different age groups, ensuring that age-appropriate environmental education is provided.

Barriers to Implementing Ecological Programs

Despite the successes of the ecological initiatives at An-Nidhamiyah, several barriers have been identified that may hinder the full implementation of these programmes. These include limited resources, especially in terms of waste management facilities, and the diverse age range of students, which presents challenges in tailoring environmental education to all learners. Limited facilities for waste management are a significant challenge. As interviews with administrators revealed, while the school has made great strides in waste management, it still relies on outdated methods. The absence of advanced recycling technologies limits the scale and efficiency of these efforts. A study by Liu et al. (2021) supports the notion that advanced waste management solutions are necessary to handle larger volumes of waste and ensure more sustainable practices.

The diverse age range of students also presents challenges in ensuring that all students can engage effectively with the ecological programmes. Younger students may require more intensive guidance and support to fully understand and implement the environmental values taught. Tailored educational programmes that cater to different age groups would help in overcoming this challenge, as suggested by Rohmah and Sayuti (2020), who found that age-appropriate environmental education improves student participation and understanding. Lack of experience among school managers in sustainable environmental management is another barrier. Although there has been some training, further development of administrative and managerial skills in the area of environmental sustainability is needed. Research by Smith et al. (2020) suggests that continuous professional development is crucial for maintaining the effectiveness of environmental programmes in schools.

Table 5. Barriers to Implementing Ecological Programs

Barrier	Description	Proposed Solutions
Limited Facilities	Waste processing relies on outdated and inefficient methods	Provide modern waste management facilities for more efficient recycling
Diverse Age of Students	Younger students require more intensive guidance	Implement age-appropriate environmental education programmes
Lack of Experience in Environmental Management	Administrators lack experience in sustainable program management	Provide further training for administrators in environmental management

Overcoming these barriers is essential for ensuring that the ecological initiatives at An-Nidhamiyah can be expanded and sustained. With improved facilities and better training for staff, the school can continue to set an example of effective environmental education. Based on the above

findings, obstacles in integrating Islamic religious education with the ecological awareness of students at the An-Nidhamiyah Islamic Boarding School include internal factors such as low student awareness, limited management competence (Arif et al., 2024; Kartiko et al., 2024), lack of integration of ecological concepts in the curriculum, as well as external factors such as lack of government support, culture of the surrounding community, and limited infrastructure. To overcome this obstacle, concrete steps are needed such as strengthening the Islamic ecology curriculum, training for pesantren managers, increasing cooperation with environmental institutions, and providing facilities that support the implementation of an environmentally friendly lifestyle in Islamic boarding schools.

CONCLUSION

The integration of Islamic values with ecological education at An-Nidhamiyah Islamic Boarding School provides a unique and effective model for fostering environmental awareness among students. The initiatives implemented, such as tree planting, waste management, and rainwater drainage systems, have significantly contributed to both environmental conservation and student engagement. The khalifah fil ardh concept has proven to be a powerful tool in linking religious teachings to pro-environmental behaviours, encouraging students to view their actions as part of their religious duty. However, challenges such as limited facilities for waste management and the need for age-appropriate educational programmes remain. To further enhance the impact of these programmes, it is recommended that the school invest in modern waste management facilities, adapt curricula to meet the needs of different age groups, and provide ongoing training for staff in sustainable environmental management practices. Additionally, government support in the form of funding for eco-friendly infrastructure and resources would greatly enhance the effectiveness and scalability of these programmes.

Future research should focus on comparative studies between An-Nidhamiyah and other pesantren, examining how similar models of integrating religious values with environmental education can be implemented and scaled in different contexts. Such studies could help identify the factors that contribute to the success of these programmes and provide valuable insights for curriculum development in other Islamic schools. Additionally, longitudinal research on the lasting impact of environmental education on students' behaviours and values would provide important data for improving and refining these educational models. The integration of Islamic environmental ethics with practical education not only benefits the students at An-Nidhamiyah but has the potential to influence broader educational practices across pesantren and other religious institutions globally.

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