Environmental Education (Eco-Islam) in the Islamic Religious Education Curriculum: A Literature Review of Integration and Its Implications

Agus Tohawi[1], Anik Indramawan[2], Muhamad Ali Anwar[3], Mastur Mastur[4], Nur Fuad[5], Achmad Fauza Setyo Utomo[6], Leily Vidya Rahma[7]

[1234567]IAI Pangeran Diponegoro Nganjuk

Article Info

ABSTRACT

The global environmental crisis demands a solution approach from various perspectives, including religion. Islam, with its comprehensive teachings (Eco-Islam), offers environmental conservation values and ethics. The integration of these values into the Islamic Religious Education (PAI) Curriculum has strategic potential to form environmentally friendly awareness and behavior from an early age. This research aims to review and synthesize literature findings regarding the Eco-Islam based environmental education integration model in the PAI curriculum, as well as analyze the implications of this integration. The literature review identified several effective integration models, such as: (1) Thematic integration into material on Aqidah, Akhlak, Fiqh, and Islamic Cultural History; (2) Environmentally based project approach; and (3) Development of special modules. The results of the study also show that this integration has positive implications for increasing ecological awareness, changing student behavior, and strengthening characters who are responsible for nature. The integration of Environmental Education (Eco-Islam) into the PAI curriculum is not only relevant but also urgent. This approach has the potential to create a generation of Muslims who are not only spiritually religious but also responsive to environmental issues. Commitment is needed from curriculum developers, educators and policy makers to realize systematic and sustainable integration.

Corresponding Author:

Name: Agus Tohawi
Institution: IAI Pangeran Diponegoro Nganjuk
E-mail: agustohawi509@gmail.com

1. INTRODUCTION

The current global environmental crisis is a multidimensional challenge encompassing climate change, pollution, and biodiversity loss. Climate change, driven by greenhouse gas emissions from human activities such as the burning of fossil fuels and deforestation, has led to an increase in the Earth's average temperature, changes in extreme weather patterns, sea level rise, and disruptions to ecological and agricultural systems. Pollution, whether of air, water, or land, worsens the quality of life for humans and other living things, contributing to

ecosystem damage and public health. Meanwhile, biodiversity loss occurs due to habitat destruction, overexploitation, pollution, and climate change, leading to species extinctions and weakening ecosystem resilience to disturbances [1], [2].

These crises are interconnected and exacerbate each other's impacts. For example, climate change accelerates biodiversity loss, while biodiversity decline reduces nature's ability to absorb carbon and stabilize the climate. Pollution also exacerbates the impacts of climate change and accelerates ecosystem degradation [3]. The social impacts of this environmental crisis are extensive, ranging from increasing poverty, food insecurity, forced migration, to social conflict due to the struggle for natural resources [4].

In the context of education, particularly Islamic Religious Education (PAI), the integration of environmental education (Eco-Islam) is highly relevant and strategic. Islam teaches principles such as khalifah (leadership of humans on earth), amanah (responsibility), and the prohibition of causing damage (fasad) to the earth. These values can serve as a strong foundation for building environmentally friendly awareness and behavior among students [5], [6]. Studies show that the integration of Islamic values into environmental education can improve students' awareness, attitudes, and behaviors regarding environmental conservation, whether through formal classroom learning, extracurricular activities, or hands-on practice such as waste management, reforestation, and water conservation [7].

However, challenges remain in implementing this integration. Some Islamic Education (PAI) curricula in Indonesia, for example, do not explicitly include environmental material, requiring teachers to creatively integrate environmental issues into their learning through contextual and thematic approaches [8], [9]. In addition, limited teacher training, lack of policy support, and the dominance of theoretical approaches without real practice are major obstacles [10], [11], [12]. Therefore, comprehensive curriculum planning, teacher training, and policy support and cross-sector collaboration are needed to ensure effective and sustainable implementation of Islamic values-based environmental education [13], [14].

The increasingly complex and multidimensional environmental crisis demands solutions that are not only technical but also address moral, social, and spiritual aspects. A multidisciplinary approach is crucial in addressing this crisis, as environmental problems cannot be solved by a single field of science alone. The integration of environmental education into the Islamic Religious Education (PAI) curriculum, known as Eco-Islam, is one such multidisciplinary approach that combines science, education, and religious values to build environmental awareness and character in students [15].

Environmental crises such as climate change, pollution, deforestation, and ecosystem destruction are the result of the interaction of various factors: economic, social, cultural, political, and spiritual. Therefore, effective solutions must involve collaboration across disciplines, including environmental science, education, public policy, and religion [16]. A multidisciplinary approach allows for synergy between scientific knowledge and ethical values, thereby shaping more sustainable behavior and policies.

Religion, especially Islam, has very strong teachings regarding human responsibility as caliph on earth (stewardship), maintaining balance (mizan), and prohibiting the commission of damage (fasad) [17], [18]. Integrating these values into environmental education can strengthen students' internal motivation to behave in an environmentally friendly manner, not only for rational reasons, but also as a form of worship and obedience to God [19], [20]. Research shows that religion-based education can increase awareness, responsibility, and concrete action in protecting the environment [21], [22]. The integration of environmental education into the Islamic Religious Education curriculum is carried out through various strategies, such as developing

teaching materials that link verses from the Qur'an and hadith with environmental issues, implementing practical activities such as tree planting, waste management, and water conservation, as well as fostering environmentally friendly behavior in schools [23], [24]. This integration model not only builds cognitive knowledge, but also forms sustainable character and habits [25], [26].

The concept of Eco-Islam is a paradigm that places Islamic teachings as the ethical and spiritual foundation for environmental conservation. This paradigm emphasizes that Islam governs not only the relationship between humans and God and fellow humans, but also the relationship between humans and the universe. In the context of education, particularly Islamic Religious Education (PAI), Eco-Islam serves as an integrative framework that connects Islamic values with environmental conservation practices, thereby fostering an ecologically aware and responsible generation [27], [28].

Eco-Islam is rooted in fundamental principles embedded in Islamic teachings, namely the concepts of khalifah (leadership of humanity on earth), mizan (balance), and amanah (trust or responsibility). These three principles form the foundation of environmental ethics in Islam and are relevant for integration into the Islamic Religious Education curriculum.[29]Islam views humans as caliphs on earth, that is, leaders and stewards of nature, mandated by God to protect, preserve, and prevent damage to the environment. This concept is reflected in the Qur'an (QS. Al-Baqarah: 30), which emphasizes that humans have a moral and spiritual responsibility to preserve the earth.[30]In educational practice, the values of the caliphate are internalized through learning that emphasizes the importance of humans' role as guardians of nature, both through teaching materials, discussions, and practical activities such as reforestation and waste management [31].

Mizan means balance, harmony, and justice in all of God's creation. Islam teaches that the universe was created in perfect balance, and humans are obligated to maintain this balance by refraining from excessive exploitation or destruction (fasad) [32]. The concept of mizan demands that humans live moderately, economically, and responsibly in using natural resources. In the Islamic Religious Education curriculum, mizan is integrated through lessons on the importance of maintaining ecosystem balance, energy conservation, and wise consumption [33].

Amanah is the trust God has given to humans to manage the earth responsibly. Every human action towards the environment will be accounted for, both in this world and the hereafter [34]. The value of trust instills an awareness that protecting the environment is part of worship and a manifestation of faith. In education, trust is actualized through the instilling of honesty, discipline, and responsibility in all activities related to the environment [35].

The integration of Eco-Islam in the Islamic Religious Education curriculum is carried out through the development of teaching materials that link verses from the Qur'an and hadith with environmental issues, strengthening character through the habituation of environmentally friendly behavior, and involving students in conservation activities such as tree planting, waste management, and water conservation.[36]Islamic boarding schools and Islamic schools are pioneers in implementing an Eco-Islamic curriculum, for example through eco-boarding school programs, green schools, and environmentally themed extracurricular activities [37]. Research shows that integrating Eco-Islamic values into education can increase ecological awareness, shape sustainable behavior, and strengthen students' Islamic identity as responsible caliphs. Furthermore, collaboration between Islamic Religious Education (PAI) teachers, science teachers, and the school community is crucial for enriching learning experiences and broadening the impact of environmental education [38].

Islamic Religious Education (PAI) occupies a strategic position as a subject that not only transmits religious knowledge but also holistically shapes students' values, character, and personality. In the context of integrating environmental education (Eco-Islam) into the PAI curriculum, this strategic role becomes even more prominent because PAI can serve as a vehicle for internalizing religious values and ecological ethics, which are much needed in the current era of environmental crisis [39], [40], [41].

Islamic Religious Education serves as the primary foundation for character formation in students by instilling the values of faith, noble morals, responsibility, discipline, tolerance, and social awareness. These values are not only taught cognitively but also internalized through habituation, teacher role models, and direct practice in daily life [42], [43]. Islamic Religious Education teachers act as moral models who guide students to apply these values in real behavior, both in the school environment and in society [44]. Research shows that Islamic Education is effective in forming religious, honest, disciplined, and responsible characters, as well as building a tolerant and inclusive attitude amidst diversity [45].

The integration of environmental education into Islamic Religious Education (PAI), or Eco-Islam, broadens the horizons of character development by instilling ecological awareness based on Islamic teachings. Concepts such as khalifah (leader on earth), amanah (responsibility), and mizan (balance) form the foundation of environmental ethics taught in PAI [46], [47]. Through this integration, students not only understand the importance of protecting the environment as part of their religious obligations, but are also encouraged to take concrete actions such as waste management, reforestation, and energy conservation [48], [49]. Programs such as Adiwiyata and Green School, which combine Islamic Religious Education with environmental education, have proven effective in building a culture of environmental awareness in schools [50].

The integration of Eco-Islam-based Environmental Education (PLH) into the Islamic Religious Education (PAI) curriculum is a strategic response to the global environmental crisis and the need to build a generation with ecological and religious character. This integration model positions Islamic values such as the concept of khalifah (leader on earth), amanah (responsibility), and mizan (balance) as the foundation of environmental ethics internalized through PAI learning. This integration is not only cognitive, but also affective and psychomotor, thus shaping environmental knowledge, attitudes, and behavior in students.

2. METHOD

This study uses a Systematic Literature Review (SLR) method to comprehensively and systematically synthesize findings from previous studies related to the integration of Environmental Education (Eco-Islam) into the Islamic Religious Education (PAI) curriculum. SLR is a scientific approach that aims to identify, evaluate, and interpret all research relevant to a specific research question, using transparent, structured, and replicable procedures.[51]Through SLR, this research not only collects data from various sources but also conducts a critical analysis of the quality, relevance, and contribution of each reviewed study, resulting in a valid synthesis of knowledge that can be used as a basis for developing educational policies and practices.

The SLR begins with the formulation of a specific research question, followed by the determination of inclusion and exclusion criteria to select relevant literature. The search process is conducted systematically through scientific databases, journals, books, and policy documents related to environmental education and Islamic Religious Education.[52]After the literature has been collected, it is selected based on relevance, methodological quality, and contribution to the topic. The selected articles are then analyzed in depth to identify key themes, trends, research gaps, and practical and theoretical implications.[53]This process

ensures that the resulting synthesis is comprehensive, objective, and scientifically sound.

The results of the SLR show that the integration of Eco-Islam based environmental education in the PAI curriculum has become a major concern in various studies in Indonesia and other Muslim countries.[54]These studies highlight the importance of Islamic values such as khalifah (leadership of humans on earth), amanah (responsibility), and mizan (balance) as the foundation of environmental ethics that are internalized through Islamic Religious Education learning.[55]This integration is carried out through the development of teaching materials, contextual learning methods, practical activities such as reforestation and waste management, and the promotion of environmentally friendly behavior in schools.[56].

SLR also found that an effective integration model involves collaboration between Islamic Education teachers, science teachers, and the school community, and is supported by educational institution policies.[57]. In addition, challenges identified include limited teacher training, lack of resources, and the need to develop a curriculum that is more adaptive to environmental issues.[58].

The implications of this integration are very broad, ranging from increasing ecological awareness, forming the character of students who care about the environment, to real contributions to sustainable development.[59], [60].

3. RESULTS
3.1 Theological Foundation of Eco-Islam in the Islamic Religious Education Curriculum

The theological foundation of Eco-Islam in the Islamic Religious Education (PAI) curriculum is firmly rooted in the teachings of the Qur'an and Hadith, which affirm the harmonious relationship between humans, nature, and God. The integration of environmental values in PAI is not only normative but also transformative, shaping ecological awareness and sustainable behavior in students. The synthesis of verses from the Qur'an and Hadith serves as the main foundation in building an environmental education paradigm based on Eco-Islam, with key concepts such as Khalifah fil Ardh (guardian of the earth), Mizan (balance), and Rahmah (compassion for all creatures) as its main pillars.[61], [62].

3.1.1 Caliph fil Ardh: Humans as Guardians of the Earth

The concept of the caliph (Quran, Al-Baqarah: 30) emphasizes that humans are appointed by God as leaders and stewards of the earth. This duty is not merely a right, but a mandate that must be carried out with full responsibility. In the context of education, this verse serves as a foundation for instilling in students that protecting and preserving the environment is part of worship and a manifestation of faith.[63]Research in Islamic boarding schools and madrasas shows that understanding the caliphate encourages students to be active in conservation activities, such as tree planting, waste management, and water conservation.[64]Through this verse-based learning, students not only understand the role of humans as spiritual beings, but also as agents of social and ecological change.[65].

3.1.2 Mizan: The Principle of Balance and the Prohibition of Destruction

The principle of mizan (balance) is reflected in many verses, such as QS. Ar-Rahman: 7-9 and QS. Ar-Rum: 41. The Qur'an emphasizes that Allah created nature in perfect balance, and humans are prohibited from causing damage (fasad) on land and sea. QS. Ar-Rum: 41 explicitly states that environmental damage is the result of human actions, thus demanding collective awareness to maintain the harmony of the ecosystem.[66]. In the PAI curriculum, these verses are integrated through learning about the importance of frugal living, moderation (israf), and preserving nature as a form of obedience to Allah.[67]Research in madrasas and Islamic boarding schools has shown that understanding mizan encourages students to

adopt a sustainable lifestyle and avoid consumer behavior.[68].

3.1.3 Rahmah: Compassion for All Creatures

The concept of rahmah (compassion) is a universal value in Islam which emphasizes the importance of doing good not only to fellow humans, but also to all living creatures. Hadith of the Prophet Muhammad SAW, such as "Whoever plants a tree, then everything he eats from that tree becomes alms for him" (HR. Ahmad), emphasizes that environmental conservation actions are a pious deed that is rewarded[69]. Another hadith about cleanliness, "Cleanliness is part of faith" (HR. Muslim), is also the basis for integrating environmental values in Islamic Religious Education.[70]Research in various Islamic educational institutions shows that internalizing the value of mercy encourages students to care about flora, fauna, and the ecosystem in general, as well as building strong ecological empathy.[71].

3.2 Eco-Islamic Integration Models in the Islamic Religious Education Curriculum

3.2.1 Thematic Integration

The integration of Eco-Islamic values into the Islamic Religious Education (PAI) curriculum through a thematic approach has become a key strategy in building students' ecological awareness and character. Recent research shows that this integration model is carried out by inserting environmental values based on Islamic teachings into existing PAI subjects, such as Aqidah (Islamic Creed), Akhlak (Ethics), Fiqh (Islamic Jurisprudence), and Islamic Cultural History. Each of these subjects has a specific role in instilling ecological values derived from the Qur'an and Hadith, as well as the life practices of the Prophet Muhammad (peace be upon him) and his companions.[72], [73], [74].

3.2.1.1 Aqidah: Nature as a Verse of Kauniyah and Strengthening Faith

In the realm of creed, Eco-Islam integration emphasizes that the universe is a kauniyah verse—a sign of God's greatness that must be contemplated and protected. Research in various Islamic schools and madrasas shows that strengthening faith through understanding kauniyah verses encourages students to view nature as a manifestation of God's power, thus making environmental protection a part of faith and worship.[75]. Learning the creed that links the creation of nature, the order of ecosystems, and natural phenomena with monotheism has proven effective in fostering a sense of gratitude, awe, and spiritual responsibility towards the environment.[76]Students are invited to reflect on the verses of the Qur'an about the creation of the heavens, earth, water, and plants, and to understand that environmental damage is a form of denial of Allah's blessings.[77], [78].

3.2.1.2 Morals: Cultivating Morals towards Nature

In the Morals subject, the integration of Eco-Islamic values is aimed at fostering behaviors that maintain cleanliness, refrain from causing damage (facades), and emulate the morals of the Prophet Muhammad SAW, who was full of compassion for living creatures. Research at MTsN 15 Jombang and Adiwiyata schools shows that moral learning linked to real practices—such as reforestation programs, waste management, and ecobrick making—can consistently shape environmentally conscious characters.[79]. The hadith about cleanliness as part of faith and the prohibition against harming animals or destroying plants becomes a moral foundation that is internalized through habituation and the example of teachers.[80]. Students not only understand the importance of protecting the environment theoretically, but are also directly involved in real actions as a form of implementing noble morals.[81], [82].

3.2.1.3 Fiqh: Fiqh Al-Bi'ah and Environmental Law

The integration of Eco-Islam into Islamic jurisprudence (fiqh al-bi'ah) is realized through discussions of

environmental jurisprudence (fiqh al-bi'ah), which covers the laws of water conservation, animal care, and the revival of dead land. Research in Islamic boarding schools (pesantren) and madrasas confirms that fiqh material discussing purification (thaharah), the prohibition on water pollution, and the recommendation to plant trees is highly relevant for building awareness of environmental law and ethics.[83]. Environmental fiqh practices, such as maintaining the cleanliness of places of worship, managing waste, and preserving natural resources, are taught as part of adherence to sharia and maqasid al-shari'ah (the objectives of sharia).[84]The Eco-Tahfiz model in Malaysia and the eco-pesantren in Indonesia prove that the integration of fiqh al-bi'ah is practically capable of forming sustainable ecological behavior among students.[85], [86].

3.2.2 Project Based Integration

The integration of Eco-Islam into the Islamic Religious Education (PAI) curriculum through a project-based learning model (PjBL) has proven effective in shaping students' religious character and environmental awareness. This model emphasizes active learning through concrete actions such as the school Adiwiyata program, tree planting, waste banks, waste management, and various other environmental projects integrated with Islamic values. Recent research in various schools and madrasahs in Indonesia shows that this approach not only increases ecological knowledge and awareness but also instills spiritual values, social responsibility, and 21st-century skills in students.[87], [88], [89].

The project-based integration model in Islamic Religious Education (PAI) directly engages students in designing, implementing, and reflecting on environmental actions based on Islamic teachings. Activities such as the Adiwiyata program, tree planting, waste banks, ecobrick making, and water conservation serve as vehicles for internalizing the values of khalifah fil ardh (caretaker of the earth), mizan (balance), and

rahmah (compassion for creatures).[90], [91]Research at Adiwiyata schools and ecological Islamic boarding schools shows that student involvement in Islamic-based environmental projects encourages real behavioral changes, such as disposing of waste properly, conserving energy, and being active in reforestation.[92].

The results of research at SDN Pekayon 16 Pagi, MTsN 1 Palangka Raya, and schools in Banjarmasin prove that project-based learning is able to instill religious character, discipline, responsibility, and love for the environment simultaneously.[93]Students not only understand theological concepts about the environment but also apply them in their daily lives through concrete actions. The waste bank program, for example, not only teaches waste management but also fosters a culture of mutual cooperation, independence, and social awareness. Tree planting and school greening serve as concrete symbols of humanity's role as caliphs on earth.[94], [95].

3.2.3 Development of Modules or Teaching Materials

The development of a module or special teaching material on Eco-Islam within the Islamic Religious Education (PAI) curriculum is a highly strategic integration model for instilling environmental values based on Islamic teachings in a systematic, structured, and contextual manner. Recent research shows that the development of this special learning unit not only enriches PAI material but also increases the effectiveness of internalizing ecological and spiritual values in students at various levels of education.[96].

The development of Eco-Islam modules is carried out through several main stages, starting from needs analysis, design, development, implementation, and evaluation. Research in Malaysia on Eco-Tahfiz emphasizes the importance of institutional support, cross-sector collaboration, and teacher training in designing teaching materials that integrate environmental themes with Islamic values, such as fiqh al-bi'ah, the principle of tawazun

(balance), and ihsan (kindness to the environment). These modules are designed to align with national and global educational goals, as well as be relevant to the cultural and religious contexts of students.[97].

Recommended development steps include[98]:

- Identification of objectives and competencies: Determining learning outcomes related to religious understanding and environmental awareness.
- Review and content enrichment: Reviewing existing Islamic Education materials and adding new content relevant to environmental issues, verses of the Qur'an, and hadiths on environmental conservation.
- Active learning design: Modules are developed with a thematic, project-based approach, discussions, case studies, and hands-on practice, such as tree planting, waste management, and water conservation.
- Use of digital media: Innovations in the form of e-modules or digital teaching materials based on scientific literacy and Islamic values have proven to be very effective and have received a positive response from teachers and students.
- Evaluation and revision: Modules are evaluated by subject matter, media, and user (teacher/student) experts to ensure their feasibility, relevance, and effectiveness.

Research in various schools and Islamic boarding schools (pesantren) shows that the use of Eco-Islam modules specifically improves students' environmentally friendly knowledge, attitudes, and behaviors. In agroecological Islamic boarding schools, for example, eco-theology-based learning structured in specific modules has encouraged collective behavioral transformations, such as water conservation, organic farming, and waste management.[99]. The module that integrates verses from the Qur'an and hadith about the environment also strengthens students' spiritual motivation to protect nature as part of their worship and responsibility as caliphs.[100].

The development of e-modules based on environmental education, local wisdom, and Al-Quran-Hadith values in elementary schools has proven to be very suitable for use, with a suitability level above 85% according to expert assessments and very positive student responses.[101]This module not only improves cognitive understanding, but also builds environmental awareness through habituation and real action.[102].

3.3 Implications of Eco-Islam Integration
3.3.1 Implementation for Students

The integration of Islamic values with environmental education (Eco-Islam) in the Islamic Religious Education (PAI) curriculum has been proven to have a significant impact on increasing knowledge, changing attitudes, and developing environmentally friendly behaviors (eco-literacy and eco-behavior) in students. Research at various levels of education shows that combining Islamic teachings—such as the concept of caliph (caretaker of the earth), trust, and responsibility—with environmental programs can foster ecological awareness and a sustainable environmental character.[103].

The integration of environmental education into Islamic Religious Education enriches students' knowledge of ecological issues, both conceptually and practically. The material taught not only covers theoretical understanding of environmental damage but also links verses from the Quran and hadith that emphasize the importance of preserving nature. Through problem-based and contextual learning, students are encouraged to understand the relationship between humans and nature as a mandate from God, so that environmental knowledge becomes an integral part of their Islamic identity. Research also highlights the need to strengthen the cognitive aspect of the curriculum so that environmental understanding is not only affective but also based on strong knowledge.[104].

Eco-Islam integration has proven effective in fostering environmental

awareness in students. This awareness develops through the internalization of Islamic values, which emphasize the importance of maintaining cleanliness, avoiding waste, and being responsible for environmental sustainability. Activities such as tree planting, waste management, water conservation, and promoting clean living habits serve as concrete ways to instill an environmental awareness. This awareness is reinforced by the example of teachers and the involvement of the entire school community in environmental-based programs [105]. Research also shows that environmental awareness built through a religious approach is more lasting and profound because it is based on spiritual beliefs.[106].

Eco-Islam integration not only improves knowledge and attitudes but also encourages real, environmentally friendly behavior. Students are actively involved in various activities such as waste collection, waste bank management, composting, reforestation, and energy conservation [107]. This behavioral habituation is carried out systematically through the curriculum, extracurricular activities, and school culture, thus forming eco-literacy and sustainable eco-behavior. Research in Islamic boarding schools and schools shows that learning based on eco-theology and fiqh al-bi'ah can internalize environmentally friendly behavior as part of worship and devotion to God. In addition, student involvement in real environmental actions strengthens a sense of social responsibility and solidarity among students.[108].

3.3.2 Implementation of the Learning Process

The integration of Eco-Islamic values into the Islamic Religious Education (PAI) learning process has brought about significant changes, making learning more contextual, active, and meaningful. Recent research shows that combining ecological principles with Islamic teachings not only enriches the material but also transforms the pedagogical approach, enabling students to be more engaged cognitively, affectively, and psychomotorically.

Eco-Islam integration makes Islamic Religious Education (PAI) learning more relevant to students' real lives. Environmental material is directly linked to verses from the Quran and Hadith, as well as environmental phenomena around students, such as waste management, water conservation, and school greening. This approach fosters awareness that protecting the environment is part of our worship and responsibility as caliphs on earth.[109]Contextual learning is also reflected in the use of case studies, discussions of local environmental issues, and hands-on practice in the field, so that students can relate religious concepts to everyday realities [110].

Eco-Islam integration encourages active learning through various participatory methods, such as problem-based learning, project-based learning, group discussions, experiments, and concrete environmental actions. Students become not only recipients of information but also key actors in the learning process, for example through tree planting activities, waste bank management, or environmental campaigns based on Islamic values [111]. Research also shows that this active learning improves students' critical thinking, collaboration, communication, and creativity skills (the 4C Skills), as well as strengthening their emotional and spiritual engagement with environmental issues.

By integrating Islamic and ecological values, learning becomes more meaningful because students feel the connection between the knowledge they learn and their life values and spiritual goals. Values such as trustworthiness, responsibility, and compassion for living things are internalized through reflection, dialogue, and teacher role models.[112]Meaningful learning is also created through direct experience and real actions that have an impact on the surrounding environment, so that students not only understand cognitively, but also experience and internalize the importance of protecting the environment as part of their devotion to God [113].

Research confirms the importance of explicit curriculum support in integrating environmental themes into Islamic Religious Education, both through core competencies, indicators, and the development of teaching materials and learning media.[114]. Methodological innovations, such as the use of digital technology, blended learning, and the integration of science with religion (naqli and aqli), also enrich the learning process and increase students' motivation and digital literacy.[115].

3.3.3 Implications for Educational Institutions

The integration of Eco-Islamic values into educational institutions has become a major catalyst for the creation of environmentally conscious school cultures and policies, or green schools. Research across educational levels, from madrasas and public schools to Islamic boarding schools and Islamic universities, shows that combining Islamic teachings with environmental education not only shapes students' character but also transforms the governance, culture, and policies of educational institutions as a whole.[116], [117].

Eco-Islam integration fosters a school culture that places environmental awareness as a core value. The values of monotheism, khalifah (vicegerent), amanah (trust), and ihsan (good deeds) are internalized through daily habits, religious symbols, and concrete practices such as tree planting, waste management, water and energy conservation.[118]This culture is strengthened by fostering environmentally friendly behavior, establishing Adiwiyata cadres, and involving the entire school community in environmental actions based on Islamic values.[119]Research at Adiwiyata schools and eco-pesantren Islamic boarding schools confirms that internalizing Islamic values in school culture is able to build a value ecosystem that unites the entire school community in a vision of environmental preservation.[120].

Eco-Islam integration is also reflected in school policies that support the creation of green schools. These policies include the development of an environmentally-based curriculum, the management of environmentally friendly facilities, and the implementation of structured and sustainable environmental programs.[121]. Schools that integrate environmental education into the Islamic Religious Education curriculum, whether intra-, extra-, or non-curricular, demonstrate an institutional commitment to building environmentally friendly school governance.[122]At the Islamic boarding school level, the eco-pesantren and fiqh al-bi'ah programs are models of policy-based environmental management integrated with Islamic values.[123].

Research highlights the importance of spiritual and transformational leadership in realizing a green school culture and policies. Principals, teachers, and administrators act as role models and key drivers of change, through example, narratives, and religious symbols that reinforce the school's eco-friendly identity.[124]This transformation process takes place gradually through internalization of values, habituation, and collaboration with external parties such as the government, community, and environmental institutions.[125], [126].

4. DISCUSSION

Thematic and project-based integration of environmental education (PLH) within the Islamic Religious Education (PAI) curriculum is considered effective because it connects knowledge, skills, and values holistically and encourages students' active involvement in solving real-world problems in their environment. The thematic approach allows for the integration of various disciplines and Islamic values within a single learning theme, enabling students to not only cognitively understand environmental concepts but also internalize the spiritual and moral values that underlie environmentally friendly behavior.[127]Meanwhile, project-based learning provides space for students to be directly involved in conservation activities, research, and real-life actions, which have been proven to improve attitudes, creativity,

and environmental awareness in a sustainable manner.[128].

The effectiveness of thematic and project-based integration in the context of Eco-Islam lies in its ability to establish links between religious teachings and environmental action. Studies in agroecological Islamic boarding schools and Islamic-based schools show that learning the Quran linked to ecotheology can transform people's behavior, free them from environmental and social crises, and foster environmental conservation cadres at the community level.[129]Islamic values such as khalifah (human leadership over the earth), amanah (responsibility), maslahah (public benefit), and tawazun (balance) provide a strong ethical and spiritual foundation for building environmental awareness and action.[130]This integration not only shapes knowledge, but also builds the character and spirituality of students, so that environmentally friendly behavior becomes part of religious worship and practice.[131].

Compared with secular approaches, which tend to emphasize cognitive and technical aspects, the Eco-Islamic approach offers a deeper and more transcendental foundation of values. Secular approaches are often oriented toward fulfilling human needs (anthropocentric) and materialistic, thus deemphasizing the spiritual dimension and moral responsibility towards nature.[132]In contrast, Eco-Islam positions humans as caliphs responsible for maintaining the balance and sustainability of nature as a form of obedience to God. These values not only build ecological awareness but also foster intrinsic motivation to behave in an environmentally friendly manner as part of faith and worship.[133].

Research in various Islamic educational institutions, such as Islamic boarding schools, madrasas, and public schools that integrate Islamic Education with Environmental Education, shows that the integration of Islamic values in environmental learning is able to significantly increase students' ecological awareness, attitudes, and behavior.[134]Practices such as reforestation,

waste management, organic farming, and water conservation are part of learning activities that are not only cognitive, but also affective and psychomotor. Furthermore, community involvement, inter-institutional collaboration, and policy support are crucial factors in the success of this integration.[135].

However, challenges remain, such as limited teacher training, a lack of comprehensive values integration, and the dominance of affective aspects over cognitive aspects in the curriculum. Therefore, developing a curriculum that balances cognitive, affective, and psychomotor aspects, as well as strengthening teacher capacity and cross-sector collaboration, is essential to ensure the sustainability and effectiveness of Eco-Islam integration in environmental education.[136].

A discussion of the suitability of the findings of the literature review on the integration of environmental education (Eco-Islam) in the Islamic Religious Education curriculum with environmental education theory and previous research indicates that there are both fundamental similarities and differences between the concept of stewardship in Western environmental education and the concept of the caliph in Islam. Historically, Western environmental education theory has emphasized the importance of stewardship or responsible environmental management, where humans are seen as guardians (stewards) who have a moral responsibility to preserve nature for the sustainability of future generations. Stewardship in this context is often rooted in secular or humanistic ethics, emphasizing social responsibility, environmental justice, and ecosystem sustainability.[137], [138], [139]The Western concept of stewardship aligns with the basic principles of environmental education, as outlined in environmental education theory by Palmer (1998) and UNESCO, which emphasizes the development of awareness, knowledge, attitudes, and skills for acting responsibly towards the environment. Previous research in the West has also highlighted the importance of integrating moral and ethical

values in environmental education, although these values are often universal and not always linked to specific spiritual or religious dimensions.[140], [141].

Meanwhile, in Islamic tradition, the concept of caliph has a more transcendental and comprehensive meaning. Caliph means not only a guardian or manager, but also a representative of God on earth, spiritually, morally, and socially responsible for maintaining the balance and sustainability of nature. This concept is based on verses of the Quran (e.g., Surah Al-Baqarah: 30) and the hadith of the Prophet Muhammad (peace be upon him), which emphasize that humans are entrusted with the responsibility to care for the earth, and every action towards the environment will be accounted for in the afterlife.[142]Values such as amanah (trust), mizan (balance), and maslahah (public benefit) form the ethical foundation that distinguishes the Eco-Islamic approach from the secular approach.[143], [144].

Recent research shows that integrating Islamic values into environmental education, such as in Islamic boarding schools (pesantren), madrasahs (Islamic schools), and Islamic schools, can foster deeper ecological awareness because it is supported by spiritual motivation and religious conviction. For example, studies at the Darularafah Raya Islamic boarding school and eco-pesantren in Indonesia show that teaching the concepts of khalifah (vicegerent) and amanah (trust) not only fosters environmentally friendly behavior but also instills a sense of spiritual responsibility as part of worship.[145]This is in line with the findings of Western research that emphasizes the importance of intrinsic motivation in developing pro-environmental behavior, but in the Islamic context, this motivation is strengthened by the dimensions of faith and accountability in the afterlife.[146].

In addition, cross-cultural research shows that the integration of religious values in environmental education can strengthen the effectiveness of environmental education, because religious values tend to be more easily accepted and internalized by students in religious societies.[147], [148], [149]This is also supported by the finding that religious-based environmental education, such as Eco-Islam, is able to build sustainable ecological character and behavior, as well as encourage collective action at the community level.[150].

However, there are also fundamental differences between the Eco-Islamic and secular approaches. The secular approach tends to emphasize the rational, scientific, and pragmatic aspects of environmental management, while Eco-Islam places environmental management as part of devotion to God and a spiritual responsibility. In Eco-Islam, environmental preservation is not only a social obligation but also a form of worship that is rewarded.[151]. In addition, Eco-Islam emphasizes balance (mizan) and justice (adl) in human interactions with nature, which often receive less attention in secular approaches that are more oriented towards utility and efficiency.[152], [153].

The implementation of Eco-Islam based environmental education in the Islamic Religious Education (PAI) curriculum faces a number of interrelated main challenges, namely limited teacher competency, a dense curriculum load, limited availability of teaching materials, and assessments that are still focused on cognitive aspects.

Islamic Religious Education (PAI) teachers play a central role in integrating Islamic environmental values into learning. However, many teachers face limitations in understanding the concept of Eco-Islam and how to teach it effectively. Studies in Malaysia and Indonesia indicate that some PAI teachers do not fully understand or are unable to practically implement the principles of fiqh al-bi'ah (Islamic environmental law). Consequently, the integration of environmental values is often theoretical and does not address practical aspects in students' daily lives.[154]. In addition, training and professional development related to Islamic-based environmental education is still very limited, so teachers tend to rely on personal knowledge and experience that is not necessarily adequate.[155]This limitation has an impact on the low internalization of

environmental values in learning and the lack of teacher role models in real actions for environmental conservation.[156].

The Islamic Religious Education curriculum in Indonesian schools is already heavily saturated with core subjects such as faith, worship, morals, history, and jurisprudence. The addition of environmental education is often seen as an additional burden that is difficult to accommodate within the limited learning time.[157]. Islamic Religious Education teachers only have about three hours of lessons per week, while the demands of the curriculum require the simultaneous achievement of competencies in the cognitive, affective, and psychomotor domains.[158]As a result, environmental material is often only briefly included or included as part of examples in learning, without adequate in-depth study and reinforcement.[159]. In addition, curriculum priorities that place greater emphasis on other issues such as religious moderation and multiculturalism also result in environmental issues receiving less attention.[160].

Limited teaching materials are a significant obstacle to the implementation of Eco-Islam in Islamic Religious Education (PAI). An analysis of high school PAI textbooks shows that environmental education materials receive little or no proper attention; if any, they are only briefly included in specific chapters without in-depth explanation.[161]Islamic Religious Education teachers often have difficulty finding references, modules, or learning media that are relevant and contextual to Islamic values and contemporary environmental issues.[162]As a result, Islamic-based environmental education relies more on lecture methods or indirect value instillation through role models and school culture, rather than structured and systematic learning.[163]This limitation also hinders project-based or thematic learning innovations that can integrate Islamic values and concrete actions for environmental conservation.[164].

The assessment system in Islamic Religious Education learning, including environmental content, is still dominated by cognitive aspects such as written tests, memorizing verses, and understanding the material.[165]. Affective (attitude) and psychomotor (real action) assessments are often ignored or only carried out as a formality, even though behavioral changes and the habituation of environmentally friendly attitudes are the main goals of Eco-Islam based environmental education.[166]Teachers also admitted to having difficulty designing and implementing authentic assessments that could measure students' internalization of values and concrete actions in protecting the environment.[167]This is exacerbated by a lack of comprehensive training and assessment guidance, as well as limited time and resources.[168].

The implementation of Eco-Islam-based environmental education in the Islamic Religious Education (PAI) curriculum requires a comprehensive strategy to ensure the effective and sustainable integration of Islamic values and environmental awareness. Based on the literature review, there are four main strategic recommendations: improving PAI teacher education and training on Eco-Islam, developing creative and applicable teacher guidebooks and student modules, collaborating with Islamic communities or institutions focused on the environment, and developing a holistic assessment system that encompasses both attitudes and skills.[169].

Islamic Religious Education (PAI) teachers are at the forefront of internalizing Islamic environmental values to students. However, many teachers still face limitations in their understanding and skills in teaching Eco-Islamic concepts in an applied manner. Therefore, structured and ongoing education and training are crucial to improve pedagogical competence, insight into Islamic ecotheology, and the ability to design contextual and innovative learning.[170]. Training can include training in integrating environmental materials into Islamic Religious Education (PAI), the use of active learning methods such as projects and case studies, and strengthening reflective practices

and teacher role models in concrete actions for environmental conservation.[171]. In addition, training also needs to equip teachers with cross-disciplinary collaboration skills and the use of environment-based learning technology.[172].

The availability of relevant, creative, and applicable teaching materials is key to the successful integration of Eco-Islam into Islamic Religious Education. The development of teacher guidebooks and student modules should include materials that link Quranic verses, hadith, and Islamic values to contemporary environmental issues, and should be complemented by practical activities, case studies, projects, and reflections.[173]A good module also integrates local wisdom, science, and technology, and encourages experiential learning and real-world action in the surrounding environment.[174]Validation by material, design, and language experts is essential to ensure the quality and usability of modules across all levels of education.[175]. In addition, the development of e-modules and digital media can expand access and increase students' interest in learning.[176].

Collaboration between schools, communities, and Islamic institutions working in the environmental sector is crucial for strengthening the implementation of Eco-Islam. This collaboration can take the form of joint programs such as tree planting, waste management, water conservation, and environmental campaigns based on Islamic values.[177]The involvement of Islamic boarding schools, mosques, religious organizations, and local communities can expand the reach of environmental education and build an environmentally conscious school culture. Furthermore, collaboration can support curriculum development, teacher training, and the provision of learning resources and supporting facilities.[178]This synergy will strengthen the role of schools as agents of social and environmental change in society.[179].

The assessment system in Eco-Islamic learning must be holistic, covering cognitive (knowledge), affective (attitude), and psychomotor (skills and real actions) aspects.[180]. Assessment does not only focus on written tests, but also uses portfolios, observations, project assessments, and self-reflection to measure the internalization of values and changes in student behavior.[181]. Project-based assessment and real actions, such as environmental conservation activities, can provide a more complete picture of learning success.[182]. In addition, the involvement of parents and the community in the assessment process can strengthen the habit of environmentally friendly behavior outside of school.[183]

4. CONCLUSION

Based on a literature review and recent research findings, the integration of Eco-Islam-based environmental education into the Islamic Religious Education (PAI) curriculum is a strategic and progressive step in developing environmental awareness, knowledge, and a caring character in the younger generation of Muslims. This integration not only strengthens religious understanding but also instills ecological responsibility rooted in Islamic spiritual values such as trustworthiness, caliphate, and harmony with nature.

The integration of environmental education into Islamic Religious Education (PAI) has been proven to shape students' character by being caring, responsible, and sustainability-oriented. Students not only understand religious teachings but are also able to apply Islamic values in concrete environmental conservation actions, such as reforestation, waste management, and water conservation. This contributes to the creation of a school and community culture that is more environmentally conscious and actively participates in preserving nature.

Some of the key challenges identified include limited teacher competency, a dense curriculum, limited availability of teaching materials, and an assessment system that still focuses on cognitive aspects. To address these challenges, recommendations include strengthening teacher training, developing creative and applicable teaching materials,

collaborating with local communities, and developing a holistic assessment system that encompasses both attitudes and skills.

REFERENCE

[1] F. N. M. Zabidi, N. A. Rahman, and L. Halim, "Integration of Islamic Values for Environmental Conservation: An Analysis of School Textbooks," *Religions (Basel)*, p., 2021, doi: 10.3390/rel12070509.

[2] A. Hajar, "Transforming Islamic Education for Environmental and Social Sustainability," *Sinergi International Journal of Islamic Studies*, p., 2024, doi: 10.61194/ijis.v2i2.601.

[3] F. N. Rohmah, "INTEGRATION OF ECOLOGICAL PRINCIPLES IN THE PESANTREN SYSTEM: A STUDY OF SUSTAINABILITY AND ENVIRONMENTAL CONSERVATION PRACTICES IN ISLAMIC EDUCATION," *Molang: Journal Of Islamic Education*, p., 2024, doi: 10.32806/gbjgwy60.

[4] N. Wakhidah and E. Erman, "Examining environmental education content on Indonesian Islamic religious curriculum and its implementation in life," *Cogent Education*, vol. 9, p., 2022, doi: 10.1080/2331186x.2022.2034244.

[5] M. K. Albar, T. Hamami, S. Sukiman, and A. R. B. Z, "Ecological Pesantren as an Innovation in Islamic Religious Education Curriculum: Is It Feasible?," *Edukasia Islamika*, p., 2024, doi: 10.28918/jei.v9i1.8324.

[6] M. Masturin, Mhd. R. Ritonga, and S. Amaroh, "Tawhid-Based Green Learning in Islamic Higher Education: An Insan Kamil Character Building," *QIJIS (Qudus International Journal of Islamic Studies)*, p., 2022, doi: 10.21043/qijis.v10i1.14124.

[7] M. Thohri, "Development of Environmentally Conscious Islamic Religious Education Curriculum at Elementary, Secondary, and Tertiary Education Levels," *Journal of Advances in Education and Philosophy*, p., 2024, doi: 10.36348/jaep.2024.v08i02.005.

[8] A. Lutfauziah, M. H. I. Al-Muhdhar, Suhadi, and F. Rohman, "Does Environmental Education Curriculum Affect Student's Environmental Culture in Islamic Boarding School," *Revista de Gestão Social e Ambiental*, p., 2024, doi: 10.24857/rgsa.v18n5-079.

[9] S. Syukri, S. M. Amir, F. Fitriani, and S. Pane, "Integration of Islamic Values with Environmental Ethics in Pesantren Education: A Case Study at Darularafah Raya Pesantren," *Jurnal Pendidikan Islam*, p., 2024, doi: 10.14421/jpi.2024.131.1-12.

[10] M. Taisir, M. I. Fitriani, and A. Quddus, "Integrating Environmental Sustainability into Islamic Religious Education Curriculum Development," *JURNAL PENELITIAN KEISLAMAN*, p., 2024, doi: 10.20414/jpk.v20i2.11777.

[11] M. Wahyu *et al.*, "Integration of Environmental Education in Islamic Religious Education Curriculum: A Sustainable Education Perspective," *Journal of Contemporary Gender and Child Studies*, p., 2024, doi: 10.61253/jcgcs.v3i2.283.

[12] Abd. A. Rekan and M. I. Mokhtar, "The Development of Eco-Tahfiz In Malaysia: Bridging Islamic Education and Environmental Sustainability," *Ulumuna*, p., 2025, doi: 10.20414/ujis.v29i1.1431.

[13] A. Pfenning-Butterworth *et al.*, "Interconnecting global threats: climate change, biodiversity loss, and infectious diseases.," *Lancet Planet Health*, vol. 8 4, p., 2024, doi: 10.1016/s2542-5196(24)00021-4.

[14] H. Pörtner *et al.*, "Overcoming the coupled climate and biodiversity crises and their societal impacts," *Science (1979)*, vol. 380, p., 2023, doi: 10.1126/science.abl4881.

[15] "Religious Education in Agricultural Environments: Integrating Islamic Teachings and Agricultural Practices for Holistic Student Development," *Religious Education*, vol. 120, pp. 58–75, 2024, doi: 10.1080/00344087.2024.2426318.

[16] Ruslan, M. Rahardjo, A. Maimun, and R. Ibrahim, "ENVIRONMENTAL CARE: THE STRENGTHENING CHARACTER EDUCATION THROUGH ISLAMIC RELIGIOUS EDUCATION (IRE) DEVELOPMENT," *Penamas*, p., 2024, doi: 10.31330/penamas.v37i1.791.

[17] B. Syafaruddin, "Ecotheology in the Perspective of Islamic Education: A Conceptual Review," *ETDC: Indonesian Journal of Research and Educational Review*, p., 2025, doi: 10.51574/ijrer.v4i3.3253.

[18] A. Serly, K. Khozin, and R. Hakim, "Internalising Environmental Values through Islamic Religious Education in Junior High School," *Halaqa: Islamic Education Journal*, p., 2025, doi: 10.21070/halaqa.v9i1.1724.

[19] S. Shahida, "Green Academia: Integrating Islamic Teachings in Education for a Sustainable Future," *Journal of Islamic Thought and Civilization*, p., 2023, doi: 10.32350/jitc.132.06.

[20] A. Begum, J. Liu, I. Marwat, S. Khan, H. Han, and A. Ariza-Montes, "Evaluating the Impact of Environmental Education on Ecologically Friendly Behavior of University Students in Pakistan: The Roles of Environmental Responsibility and Islamic Values," *Sustainability*, p., 2021, doi: 10.3390/su131810188.

[21] N. A. Rahman, F. N. M. Zabidi, and L. Halim, "Integration of Tauhidic Elements for Environmental Education from the Teachers' Perspectives," *Religions (Basel)*, p., 2020, doi: 10.3390/rel11080394.

[22] D. A. Setianingrum, Setiyo, and A. Dwiyanto, "Environmental Education through Islamic Lens: Values and Practices," *E3S Web of Conferences*, p., 2024, doi: 10.1051/e3sconf/202448204014.

[23] Juliani, H. Mahdi, S. W. Sari, S. I. Sari, and N. R. Nazwa, "Green Islamic School: Integrating Environmental Education in the Islamic Education Curriculum," *Cendekiawan : Jurnal Pendidikan dan Studi Keislaman*, p., 2024, doi: 10.61253/cendekiawan.v3i3.270.

[24] A. Rohman, E. Kurniawan, M. Syifauddin, S. Muhtamiroh, and A. Muthohar, "Religious Education For The Environment: Integrating Eco-Theology In The Curriculum of Islamic Religious And Character Education To Enhance Environmental Education In Indonesia," *Nadwa: Jurnal Pendidikan Islam*, p., 2024, doi: 10.21580/nw.2024.18.2.21094.

[25] H. Muzakki, Moh. Arif, and M. Mamah, "Integration of Islamic Education Values and Fiqh al-Bi'ah in Cultivating Environmentally Responsible Character," *Cendekia: Jurnal Kependidikan dan Kemasyarakatan*, p., 2025, doi: 10.21154/cendekia.v23i1.10272.

[26] A. M. K. Amrullah, A. Murfi, A. Fauzi, and B. Basri, "Integrating Islamic Education with Environmental Programs: Strategies for Sustainable Character Development at SMAN 2 and 7 Malang Indonesia," *The Qualitative Report*, p., 2025, doi: 10.46743/2160-3715/2025.6020.

[27] N. Mohamed, "Islamic Education, Eco-ethics and Community," *Studies in Philosophy and Education*, vol. 33, pp. 315–328, 2014, doi: 10.1007/s11217-013-9387-y.

[28] W. K. A. W. Mokhtar *et al.*, "Understanding Islamic Teachings Related to Hygiene Education in The Eco-Tourism Industry," *International Journal of Academic Research in Progressive Education and Development*, p., 2023, doi: 10.6007/ijarped/v12-i4/20026.

[29] Al'Adalah *et al.*, "ELUCIDATING ECO-RELIGIOUS IN ISLAMIC STUDIES AND THE FUTURE OF ENVIRONMENTAL ETHICS," *Al'Adalah*, p., 2023, doi: 10.35719/aladalah.v26i2.370.

[30] A. Zuhdi, M. Bilhaq, L. R. Putri, Y. P. Islam, and D. Thufulah, "Islamic Philosophy's Approach to Environmental Ethics: An Analysis of the Teachings of the Qur'an and Hadith," *Journal of Noesantara Islamic Studies*, p., 2024, doi: 10.70177/jnis.v1i4.1392.

[31] M. Amiruddin, M. Syam, and J. Arsyad, "Teologi Lingkungan dalam Al-Qur'an Perspektif Ibrahim Abdul Matin," *Al-Mau'izhoh*, p., 2024, doi: 10.31949/am.v6i2.8558.

[32] Sadali, "Harnessing Islamic Teachings for Climate Justice: Pathways for Faith-Based Environmental Action," *Sinergi International Journal of Islamic Studies*, p., 2023, doi: 10.61194/ijis.v1i3.597.

[33] M. A. Fitryansyah, "Islamic Perspective on Urban Ecology Environmental Preservation in The Context of Urbanization," *Al-Madinah: Journal of Islamic Civilization*, p., 2024, doi: 10.70901/2qf36d84.

[34] M. Alhinai and A. Ringer, "Amanah and umma: Eco-Islam and epistemological diversity in environmental communication," *Front Commun (Lausanne)*, p., 2025, doi: 10.3389/fcomm.2025.1568627.

[35] M. Ali and M. Agushi, "Eco-Islam: Integrating Islamic Ethics into Environmental Policy for Sustainable Living," *International Journal of Religion*, p., 2024, doi: 10.61707/gq0we205.

[36] Subaidi, A. Tantowi, N. Cholid, M. Junaedi, Waluyo, and M. Nursikin, "Eco-pesantren: Islamic Education in Forest Conservation Landscapes," *Fudan Journal of the Humanities and Social Sciences*, vol. 16, pp. 541–567, 2023, doi: 10.1007/s40647-023-00386-w.

[37] A. F. Asshidiqi and A. R. Sholihah, "Creating Environmentally Sustainable Mosques: Combining Religious Principles With Ecological Practices," *International Journal of Science and Applied Science: Conference Series*, p., 2024, doi: 10.20961/ijsascs.v7i2.96732.

[38] Zulaika, S. Vahlepi, W. Soleh, and N. S. U. B. Aliudin, "Green Spirituality in The Qur'an: Integration of Spiritual Values and Environmental Conservation Education," *Jurnal Progress: Wahana Kreativitas dan Intelektualitas*, p., 2025, doi: 10.31942/pgrs.v13i1.12693.

[39] E. Pujianti and H. A. Nugraha, "Role of Islamic Religious Education Teachers in Shaping the Inclusive Character of Students," *Journal Corner of Education, Linguistics, and Literature*, p., 2025, doi: 10.54012/jcell.v4i001.402.

[40] V. M. Herfany and A. Abdurrasyid, "The Role of Islamic Religious Education Teachers in Shaping Students' Character at SMK 8 Negeri Medan," *JIM: Jurnal Ilmiah Mahasiswa Pendidikan Sejarah*, p., 2024, doi: 10.24815/jimps.v9i4.33600.

[41] T. A. Rizka, P. F. Sholihah, N. Y. Safara, and M. Y. M. El-Yunusi, "The Role Of Islamic Religious Education In Shaping Students' Character," *Wahana*, p., 2024, doi: 10.36456/wahana.v76i2.9671.

[42] Y. Bachtiar and H. Salim, "Instilling Student Discipline Through Islamic Religious Education Activities," *Indonesian Journal of Innovation Studies*, p., 2025, doi: 10.21070/ijins.v26i3.1522.

[43] N. Aziza, E. Suryana, and Zulhijra, "Islamic Religious Education in the Formation of Moral and Religious Values," *Academia Open*, p., 2025, doi: 10.21070/acopen.10.2025.11210.

[44] M. Hafiz, F. Mirza, and W. Kurniawan, "Reconstruction of Islamic Religious Education Curriculum in Building Moderate Student Character in the Digital Era," *Edusoshum : Journal of Islamic Education and Social Humanities*, p., 2025, doi: 10.52366/edusoshum.v5i2.142.

[45] M. Komalasari and A. B. Yakubu, "Implementation of Student Character Formation Through Islamic Religious Education," *At-tadzkir: Islamic Education Journal*, p., 2023, doi: 10.59373/attadzkir.v2i1.16.

[46] J. Fira *et al.*, "Islamic Religious Education Curriculum as a Pillar of Islamic Character Formation for Students," *Journal of Contemporary Islamic Primary Education*, p., 2024, doi: 10.61253/jcipe.v3i2.311.

[47] U. Hasanah, S. N. Nasution, and H. A. Nuraeni, "Environmental-Based Islamic Religious Education to Shape Students' Religious Character in Elementary School.," *Jurnal Progress: Wahana Kreativitas dan Intelektualitas*, p., 2024, doi: 10.31942/pgrs.v12i2.12350.

[48] M. Taufik, "STRATEGIC ROLE OF ISLAMIC RELIGIOUS EDUCATION IN STRENGTHENING CHARACTER EDUCATION IN THE ERA OF INDUSTRIAL REVOLUTION 4.0," *Jurnal Ilmiah Islam Futura*, p., 2020, doi: 10.22373/jiif.v20i1.5797.

[49] A. Mahdiyah *et al.*, "Strategy for Strengthening Islamic Religious Education Curriculum in Forming Children's Islamic Character," *Journal of Contemporary Gender and Child Studies*, p., 2024, doi: 10.61253/jcgcs.v3i2.282.

[50] D. A. Haerudin, "RELIGIOUS EDUCATION IN FORMING STUDENTS' CHARACTER," *Edukasi Islami: Jurnal Pendidikan Islam*, p., 2025, doi: 10.30868/ei.v14i01.8132.

[51] S. Mahmud *et al.*, "Integrating Howard Gardner's Multiple Intelligences in Islamic Education: A Systematic Review of Indonesian Practices," *Jurnal Ilmiah Peuradeun*, p., 2024, doi: 10.26811/peuradeun.v12i3.1215.

[52] R. Riskawati, "Eco-Islamic Boarding School Waste Management: A Systematic Literature Review Approach," *Indonesian Journal of Contemporary Multidisciplinary Research*, p., 2023, doi: 10.55927/modern.v2i5.5880.

[53] S. Druker-Ibáñez and L. Cáceres-Jensen, "Integration of indigenous and local knowledge into sustainability education: a systematic literature review," *Environ Educ Res*, vol. 28, pp. 1209–1236, 2022, doi: 10.1080/13504622.2022.2083081.

[54] S. Ramli *et al.*, "Eco-Spiritual Based Green Spirituality : A Systematic Literature Review of Environmentally Conscious Mental Revolution in Education," *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran*, p., 2024, doi: 10.33394/jk.v10i4.13318.

[55] T. K. Gebrekidan, "Environmental education in Ethiopia: History, mainstreaming in curriculum, governmental structure, and its effectiveness: A systematic review," *Heliyon*, vol. 10, p., 2024, doi: 10.1016/j.heliyon.2024.e30573.

[56] R. Nabila and D. Abrianto, "Implementasi Pembelajaran PAI Berbasis Ecoliteracy di SMP Negeri 3 Binjai," *Riwayat: Educational Journal of History and Humanities*, p., 2025, doi: 10.24815/jr.v8i2.45230.

[57] E. Olsen, D. Lawson, L. McClain, and J. Plummer, "Heads, hearts, and hands: a systematic review of empirical studies about eco/climate anxiety and environmental education," *Environ Educ Res*, vol. 30, pp. 2131–2158, 2024, doi: 10.1080/13504622.2024.2315572.

[58] I. Ibrahim, T. R. A. A. Razak, M. Asmawi, and A. Sarkawi, "ENVIRONMENTAL CONSERVATION IN ISLAMIC PERSPECTIVE: A SYSTEMATIC REVIEW," *Quantum Journal of Social Sciences and Humanities*, p., 2024, doi: 10.55197/qjssh.v5i6.589.

[59] A. Athoillah, "Eco-Islamic Boarding School Indicators For Increasing Environmental Awareness And Sustainable Development In Indonesia," *WACANA, Jurnal Sosial dan Humaniora*, p., 2024, doi: 10.21776/ub.wacana.2024.027.01.04.

[60] H. Murtadoilah and D. Rusmidi, "Applying the Hadith on Cleanliness in Eco-Theological Islamic Education at Community Learning Centers (PKBM)," *Journal of Society and Development*, p., 2025, doi: 10.57032/jsd.v5i1.297.

[61] M. F. Haikal and S. Anwar, "Transformation of Islamic Religious Education Learning Materials: Implementation of Qur'anic and Hadith Elements in Primary School," *Profesi Pendidikan Dasar*, p., 2024, doi: 10.23917/ppd.v11i3.7619.

[62] S. M. S.H., Ach. Sayyi, M. Nirmala, and S. Elango, "Transformation of Environmental Education in Pesantren: Integration of Islamic Values and STEAM Approach," *FIKROTUNA: Jurnal Pendidikan dan Manajemen Islam*, p., 2024, doi: 10.32806/jf.v14i2.684.

[63] M. Yusuf, B. Bargot, R. N. Siregar, and A. P. Harahap, "Implementation of Hadith as a Foundation for Deradicalization in Contemporary Islamic Education Curriculum," *AT-TURAS: Jurnal Studi Keislaman*, p., 2024, doi: 10.33650/at-turas.v11i2.9358.

[64] W. Habibah, A. R. Sofa, Abd. Aziz, I. Bukhori, and M. H. Islam, "Integrasi Nilai-Nilai Al-Qur'an dan Hadits dalam Pendidikan untuk Membangun Tanggung Jawab Konservasi Alam di Madrasah Ibtidaiyah Ihyaul Islam Pakuniran," *Jurnal Budi Pekerti Agama Islam*, p., 2024, doi: 10.61132/jbpai.v3i1.854.

[65] I. Al Walidah and I. Husaini, "REINTERPRETATION OF ECOLOGICAL VERSES TO IMPLEMENT ECO-ETHICS IN ISLAMIC EDUCATION," *Jurnal Tatsqif*, p., 2023, doi: 10.20414/jtq.v21i1.7401.

[66] K. Karman, R. Anwar, and L. Hakim, "The Qur'anic Learning Based on Islamic Eco-Theology at Pesantren," *Jurnal Pendidikan Islam*, p., 2023, doi: 10.15575/jpi.v9i2.24933.

[67] D. Derysmono and A.- Kahfi, "Islamic Environmental Ethics and Waste-to-Energy Innovation: Insights from the Quran," *JOURNAL OF QUR'AN AND HADITH STUDIES*, p., 2025, doi: 10.15408/quhas.v14i1.45155.

[68] Kartika, M. Galib, and A. Abubakar, "Upaya Pelestarian Lingkungan Hidup dalam Kajian Tafsir Tematik," *Jurnal Alwatzikhoebillah : Kajian Islam, Pendidikan, Ekonomi, Humaniora*, p., 2025, doi: 10.37567/alwatzikhoebillah.v11i1.3505.

[69] S. Syaharuddin, F. Maujud, and H. U. Mashwani, "The Integration of the Qur'an and Hadith in Planning for Sustainable Islamic Education," *JIE (Journal of Islamic Education)*, p., 2025, doi: 10.52615/jie.v10i1.514.

[70] N. Norlianti, S. R. Aliyah, and H. Zainuri, "Principles of Islamic Religious Education Curriculum Development," *ISTIFHAM: Journal Of Islamic Studies*, p., 2024, doi: 10.71039/istifham.v2i3.71.

[71] N. A. Mohidem and Z. Hashim, "Integrating Environment with Health: An Islamic Perspective," *Soc Sci*, p., 2023, doi: 10.3390/socsci12060321.

[72] A. R. Ridho, N. A. Setyariza, S. E. Widayati, I. K. Wardani, and Y. Handayani, "Evaluasi Pembelajaran Pendidikan Agama Islam Berbasis Ranah Afektif," *Hikmah : Jurnal Studi Pendidikan Agama Islam*, p., 2025, doi: 10.61132/hikmah.v2i1.599.

[73] K. A. Rahmawati, L. S. Ilma, I. Rahayu, H. Asrohah, and H. S. Zaniyati, "Islamic Curriculum Innovation in Integrated Islamic Elementary Schools as an Integrative Approach in Learning Jurisprudence, Akidah, and Tajweed," *Indonesian Journal of Innovation Studies*, p., 2025, doi: 10.21070/ijins.v26i3.1404.

[74] A. N. 'Abidah and K. Umam, "Optimalisasi Pembelajaran Akidah Akhlak dalam Menumbuhkan Karakter Peduli Lingkungan melalui Program P5 PPRA di MTsN 15 Jombang," *YASIN*, p., 2025, doi: 10.58578/yasin.v5i4.5779.

[75] I. Haq, S. L, and M. Amiruddin, "Eco-Theological Insights on The Sasi Tradition: Analyzing Environmental Ethics and Sanctions Through Fiqh al-Bi'ah and Islamic Criminal Law," *Al-Istinbath: Jurnal Hukum Islam*, p., 2025, doi: 10.29240/jhi.v10i1.9412.

[76] S. Su'eb, "Development of Islamic Religious Education Curriculum And Its Implementation at MTs Al Khoziny Buduran Sidoarjo," *Al Hikmah: Journal of Education*, p., 2024, doi: 10.54168/ahje.v5i2.328.

[77] S. Fahlawi, R. E. Pertiwi, I. Agama, I. Nurul, and H. L. Barat, "Islamic Education Curriculum Based on Environmental Awareness at Madrasah Tsanawiyah Al Mansyuriyah Lombok Tengah Year 2024," *Journal of Practice Learning and Educational Development*, p., 2025, doi: 10.58737/jpled.v5i1.397.

[78] R. Ridhwan and W. Wardhana, "PENDIDIKAN ISLAM BERWAWASAN LINGKUNGAN HIDUP PADA MADRASAH IBTIDAIYAH DI BONE SULAWESI SELATAN," *Jurnal MUDARRISUNA: Media Kajian Pendidikan Agama Islam*, p., 2019, doi: 10.22373/jm.v9i1.4844.

[79] M. Faisol, F. Syukur, and R. Raharjo, "Islamic Religious Education Model with Environmental Insight at SMA N 2 Demak," *Edukasi Islami: Jurnal Pendidikan Islam*, p., 2022, doi: 10.30868/ei.v11i02.2341.

[80] M. Miftahuddin, A. Aman, and R. D. A. Yuliantri, "The model of Islamic character education at SMP-SMA Al-Irsyad Al-Islamiyyah boarding school Purwokerto," *Jurnal Cakrawala Pendidikan*, p., 2024, doi: 10.21831/cp.v43i2.66516.

[81] I. Abrori, Tobroni, Romelah, and A. Ikhwan, "Strengthening Islamic Religious Education Values in Developing Independent Character," *Al-Hayat: Journal of Islamic Education*, p., 2024, doi: 10.35723/ajie.v8i3.580.

[82] M. Rofiq and M. A. Suwandi, "Implementation Of Innovation And Literacy In Islamic Education Curriculum Development," *Jurnal Penelitian Multidisiplin*, p., 2023, doi: 10.58705/jpm.v2i2.164.

[83] S. Rukmana, M. Pasaribu, and S. Sofyan, "Holistic Integration of Islamic Religious Education Values: A Comprehensive Strategy for Character Development at MAN 1 Tapanuli Tengah," *FIKROTUNA: Jurnal Pendidikan dan Manajemen Islam*, p., 2024, doi: 10.32806/jf.v14i2.636.

[84] P. Pratama, N. Asni, and M. Wahyudi, "PENGARUH PELAJARAN PENDIDIKAN AGAMA ISLAM DALAM KENAKALAN REMAJA BAGI SISWA SMK TAMAN PENDIDIKAN PERDAGANGAN , BANDAR," *Jurnal At-Tabayyun*, p., 2021, doi: 10.62214/jat.v4i2.67.

[85] S. Lutfi, H. Hamdanah, and N. Normuslim, "Integration of PAI with Environmental Preservation: Building Ecological Piety for Students at School," *International Journal of Humanities, Education, and Social Sciences*, p., 2025, doi: 10.58578/ijhess.v3i2.5290.

[86] L. D. Putri, C. Nugroho, A. Malik, and M. Nastain, "Developing ecological piety in pesantren: the Kyai's cognition and the practice of living fiqh al-bī'ah in Banten," *Ijtihad : Jurnal Wacana Hukum Islam dan Kemanusiaan*, p., 2024, doi: 10.18326/ijtihad.v23i2.235-259.

[87] D. Fitria, "Project-Based Learning Model in Improving Student Learning Outcomes of Elementary School 22 Kampung Taji in Islamic Education Learning," *Indonesian Journal of Education and Social Humanities*, p., 2024, doi: 10.62945/ijesh.v1i3.250.

[88] M. Ali and M. Bahtera, "Islam in Agricultural Islamic Boarding Schools to Promote Ecosophy (Ecological Philosophy) for Environmental Protection," *MIKHAYLA : Journal of Advanced Research*, p., 2024, doi: 10.61579/mikhayla.v1i1.171.

[89] I. Emilya and N. Nurlaili, "Analysis of the Use of Project-Based Learning Model in Enhancing the Activeness of Grade IX Students at MTs 01 Darussalam Kepahiang," *JURNAL PENDIDIKAN IPS*, p., 2025, doi: 10.37630/jpi.v15i2.2702.

[90] N. D. Ngoc and N. T. K. Hoan, "APPLYING PROJECT-BASED LEARNING TO EDUCATE PRIMARY SCHOOL STUDENTS ON ENVIRONMENTAL PROTECTION," *Journal of Science Educational Science*, p., 2024, doi: 10.18173/2354-1075.2024-0067.

[91] G. N. K. Mr, A. Hafiz, and B. Barsihanor, "ISLAMIC BASED ECO-FRIENDLY CHARACTER EDUCATION: A CASE STUDY OF ELEMENTARY SCHOOLS IN BANJARMASIN," *Muallimuna : Jurnal Madrasah Ibtidaiyah*, p., 2024, doi: 10.31602/muallimuna.v10i1.16481.

[92] D. M. A. Pratama and Z. Abidin, "Implementation of Project-Based Learning Model in Islamic Religious Education for Grade X at Muhammadiyah Senior High School 1 Surakarta," *JUSPI (Jurnal Sejarah Peradaban Islam)*, p., 2024, doi: 10.30829/juspi.v8i1.20622.

[93] L. S. Romlah, R. Purnama, R. Ambarwati, U. Hijriyah, C. Amriyah, and W. J. Z, "Environmental-based Learning Management in Islamic Education Institutions," *E3S Web of Conferences*, p., 2024, doi: 10.1051/e3sconf/202448204019.

[94] Q. Khoir and R. Rusik, "Peran Pendidikan Agama Islam dalam Pembentukan Kesadaran Ekologis: Studi Integrasi Konsep Green Islam," *BAHTSUNA: Jurnal Penelitian Pendidikan Islam*, p., 2024, doi: 10.55210/bahtsuna.v6i1.433.

[95] S. Samsuddin and I. S. Siregar, "Optimizing Islamic Religious Education: A Case Study on Curriculum Management in Planning, Implementation, and Evaluation," *AL-ISHLAH: Jurnal Pendidikan*, p., 2024, doi: 10.35445/alishlah.v16i4.6389.

[96] N. Mukaromah, S. Suadi, and W. Maso, "Evaluating an Environment-Based Learning Model Oriented Towards ESD to Foster Environmental Care Character in Madrasah Ibtidaiyah Students," *Bidayatuna Jurnal Pendidikan Guru Mandrasah Ibtidaiyah*, p., 2025, doi: 10.54471/bidayatuna.v8i1.3514.

[97] St. Nuralimah, M. A. Maulana, and Y. Peng, "Implementation of Project-Based Learning to Increase Student Engagement and Motivation in Learning Islamic Religious Education," *Bulletin of Social Studies and Community Development*, p., 2025, doi: 10.61436/bsscd.v3i2.93.

[98] M. A. Ma`arif, M. H. Rofiq, and A. Sirojuddin, "Implementing Learning Strategies for Moderate Islamic Religious Education in Islamic Higher Education," *Jurnal Pendidikan Islam*, p., 2022, doi: 10.15575/jpi.v8i1.19037.

[99] A. A. Fajarudin, A. I. Muttaqin, M. Darwis, and I. Artikel, "DESIGNING AN ECOLOGICAL PARADIGM OF ISLAMIC EDUCATION BASED ON PESANTREN," *Proceeding of International Conference on Education and Sharia*, p., 2024, doi: 10.62097/ices.v124.85.

[100] "Development of e-modules based on science literacy and Islamic values in ecosystem materials," *Research and Development in Education (RaDEn)*, p., 2023, doi: 10.22219/raden.v3i2.23326.

[101] M. Maulisa, E. S. Rahmawati, and H. Zainuri, "Learning Methods for Islamic Religious Education in the Merdeka Curriculum," *ISTIFHAM: Journal Of Islamic Studies*, p., 2025, doi: 10.71039/istifham.v2i3.69.

[102] A. Fahmi, M. Yusuf, and M. Muchtarom, "Integration of Technology in Learning Activities: E-Module on Islamic Religious Education Learning for Vocational High School Students," *Journal of Education Technology*, p., 2021, doi: 10.23887/jet.v5i2.35313.

[103] N. Hidayah, Y. Yanti, and S. Afriana, "Development of thematic e-modules based on environmental education, local wisdom, and Islamic value in elementary school," *PROCEEDINGS OF THE TEGAL INTERNATIONAL CONFERENCE ON APPLIED SCIENCES 2022: Applied Science Research Post-Covid-19 Pandemic*, p., 2024, doi: 10.1063/5.0207287.

[104] S. Zuhriyeh, M. Ali, and A. Hidayat, "Digital Transformation of Islamic Education: An Artificial Intelligence-Based Teaching Module Development Study," *Edunesia : Jurnal Ilmiah Pendidikan*, p., 2025, doi: 10.51276/edu.v6i2.1255.

[105] D. Amalia, "The Integration of Eco-Literacy in Teaching-Learning Activities as An Effort to Reduce Environmental Crisis," *Madinah: Jurnal Studi Islam*, p., 2024, doi: 10.58518/madinah.v11i2.2962.

[106] S. Santosa, I. Kamala, and T. T. Ulfah, "Formation of Student Character Through Islamic-Based Environmental Education Activities," *Jurnal Penelitian Pendidikan IPA*, p., 2023, doi: 10.29303/jppipa.v9i11.4324.

[107] A. Begum, L. Jingwei, M. Haider, M. Ajmal, S. Khan, and H. Han, "Impact of Environmental Moral Education on Pro-Environmental Behaviour: Do Psychological Empowerment and Islamic Religiosity Matter?," *Int J Environ Res Public Health*, vol. 18, p., 2021, doi: 10.3390/ijerph18041604.

[108] R. Br, "Teachers' belief and practice in environmental education: evidence from an Indonesian Islamic primary school," *Educ 3 13*, p., 2024, doi: 10.1080/03004279.2024.2351553.

[109] W. S. Bahri, M. Zuhdi, and S. Suparto, "Integrating Naqli and Aqli Science in Islamic Education: Toward a Comprehensive Learning Model," *J-PAI: Jurnal Pendidikan Agama Islam*, p., 2025, doi: 10.18860/jpai.v11i2.31447.

[110] S. J. Alfarisy and Iswandi, "INTEGRATION OF CHARACTER EDUCATION VALUES IN ISLAMIC RELIGIOUS EDUCATION LEARNING AT SCHOOL," *Multidisciplinary Indonesian Center Journal (MICJO)*, p., 2025, doi: 10.62567/micjo.v2i2.660.

[111] M. R. Nasucha, K. Khozin, and I. Thoifah, "Synergizing Islamic Religious Education and Scientific Learning in the 21st Century: A Systematic Review of Literature," *Jurnal Pendidikan Agama Islam (Journal of Islamic Education Studies)*, p., 2023, doi: 10.15642/jpai.2023.11.1.109-130.

[112] D. S. Anugrah, U. Supriadi, S. Anwar, and N. M. Lathif, "INTEGRATING PROBLEM-BASED LEARNING WITH ISLAMIC PRACTICE: A SYSTEMATIC REVIEW OF EDUCATIONAL OUTCOMES AND RELIGIOUS ENGAGEMENT," *Al-Qalam*, p., 2025, doi: 10.31969/alq.v31i1.1606.

[113] H. Siregar, N. Nurhamzah, M. Munir, and M. Fikri, "Enhancing Islamic Education through Technology Integration: A Study of Teaching Practices in Indonesia," *Jurnal Ilmiah Peuradeun*, p., 2025, doi: 10.26811/peuradeun.v13i2.1875.

[114] R. Moslimany, A. Otaibi, and F. Shaikh, "Designing a holistic curriculum: Challenges and opportunities in islamic education," *Journal on Islamic Studies*, p., 2024, doi: 10.35335/beztg009.

[115] N. A. Azman, M. I. Hamzah, and K. A. Razak, "DIGITAL INTEGRATION IN PRIMARY SCHOOL ISLAMIC EDUCATION: TEACHERS' PERSPECTIVES ON ITS IMPACT ON STUDENTS' LEARNING," *Malaysian Journal of Learning and Instruction*, p., 2025, doi: 10.32890/mjli2025.22.2.3.

[116] N. A. Rahman, F. N. M. Zabidi, and M. H. Jalil, "How To Integrate Environmental Education: Analysis of Teachers' Perspectives in Integrated Islamic Science Schools," *International Journal of Education*, p., 2023, doi: 10.5296/ije.v15i2.20611.

[117] A. A. Safei and E. Himayaturohmah, "Development of Environmentally Friendly Culture in the Islamic Boarding School through Social Intervention Strategy," *Al-Hayat: Journal of Islamic Education*, p., 2023, doi: 10.35723/ajie.v7i1.323.

[118] S. Wahjusaputri, S. Suwardi, and F. A. Nazhif, "Evaluation Study of the Green School Program in Islamic Schools," *QALAMUNA: Jurnal Pendidikan, Sosial, dan Agama*, p., 2025, doi: 10.37680/qalamuna.v17i1.5161.

[119] D. Goldman, O. Ayalon, D. Baum, and B. Weiss, "Influence of 'green school certification' on students' environmental literacy and adoption of sustainable practice by schools," *J Clean Prod*, vol. 183, pp. 1300–1313, 2018, doi: 10.1016/j.jclepro.2018.02.176.

[120] M. T. B. Kejora, A. Komariah, E. Herawan, and A. Sudarsyah, "Ekopesantren: An Ecology-Based Education Model with Local Wisdom Supports the Sustainable Development Goal's," *AL-ISHLAH: Jurnal Pendidikan*, p., 2025, doi: 10.35445/alishlah.v17i1.6246.

[121] S. Anabarja and A. Mubah, "The Islamic Environmentalism in Eco-Pesantren Initiatives: Integrating the Sustainable Development Values in Islamic Boarding School," *Journal of International Studies on Energy Affairs*, p., 2021, doi: 10.51413/jisea.vol2.iss1.2021.75-90.

[122] M. Maslani, W. Hidayat, A. Qadir, and A. Muhyidin, "Ecopedagogy in Action: An Ethnographic Exploration of Environmental Preservation Strategies in Pesantren," *Jurnal Pendidikan Islam*, p., 2023, doi: 10.15575/jpi.v9i2.29347.

[123] R. Rohmatulloh, A. Hasanah, L. Sahlani, and M. Zuhri, "Energy-Saving Triangle: Internalizing Islamic Ethical Values on Energy Saving in Integrative Learning," *Religions (Basel)*, p., 2023, doi: 10.3390/rel14101284.

[124] V. I. Ahmad, N. Ali, and I. A. Zuhriyah, "Islamic Values in Environmental School Culture: Character Formation and Challenges," *EDUKASIA Jurnal Pendidikan dan Pembelajaran*, p., 2025, doi: 10.62775/edukasia.v6i1.1400.

[125] A. Altassan, "Sustainable Integration of Solar Energy, Behavior Change, and Recycling Practices in Educational Institutions: A Holistic Framework for Environmental Conservation and Quality Education," *Sustainability*, p., 2023, doi: 10.3390/su152015157.

[126] A. Muzadi and S. Mutholingah, "INTEGRASI PENDIDIKAN BERWAWASAN LINGKUNGAN HIDUP (GREEN SCHOOL) MELALUI PEMBELAJARAN PAI DI SEKOLAH," *journal TA'LIMUNA*, p., 2019, doi: 10.32478/talimuna.v8i2.292.

[127] M. Genç, "The project-based learning approach in environmental education," *International Research in Geographical and Environmental Education*, vol. 24, pp. 105–117, 2015, doi: 10.1080/10382046.2014.993169.

[128] T. W. Mulya and F. Salvi, "'Grass, rice, and aubergine': a case study of an Islamic eco- pesantren in Indonesia," *Pedagogy, Culture & Society*, p., 2024, doi: 10.1080/14681366.2024.2385049.

[129] M. H. Zikargae, A. G. Woldearegay, and T. Skjerdal, "Empowering rural society through non-formal environmental education: An empirical study of environment and forest development community projects in Ethiopia," *Heliyon*, vol. 8, p., 2022, doi: 10.1016/j.heliyon.2022.e09127.

[130] M. Shefer-Mossnesohn, "Modern Islamic Eco-Religion," *Journal for the Study of Religion, Nature and Culture*, p., 2025, doi: 10.1558/jsrnc.27632.

[131] H. Yolcu, "Using project-based learning in an environmental education course and revealing students' experiences: A case study," *Sci Act*, vol. 60, pp. 119–125, 2023, doi: 10.1080/00368121.2023.2205825.

[132] N. Hasrina, L. A. Yanti, and K. Kamarullah, "Integrating Environmental Themes into English Language Teaching: Current Practices and Future Strategies," *Journal on Education*, p., 2024, doi: 10.31004/joe.v7i2.7906.

[133] J. A. López and F. J. P. Palacios, "Effects of a Project-Based Learning Methodology on Environmental Awareness of Secondary School Students," *International Journal of Instruction*, p., 2024, doi: 10.29333/iji.2024.1711a.

[134] S. Al Ayyubi and P. A. W. Wisudawati, "Building Environmental Awareness: Problem-Based Learning Based on Constructivism," *FIKROTUNA: Jurnal Pendidikan dan Manajemen Islam*, p., 2025, doi: 10.32806/jf.v15i1.652.

[135] T. Wijanarko, "Development of integrative thematic environment-based learning materials," *Jurnal Kependidikan Penelitian Inovasi Pembelajaran*, p., 2024, doi: 10.21831/jk.v8i2.45269.

[136] H. D. Ayu, A. Jufriadi, and H. Pratiwi, "Transformation of Critical Thinking in Environmental Education: Integration of Project-Based Learning and Technology," *Online Learning In Educational Research (OLER)*, p., 2025, doi: 10.58524/oler.v5i1.598.

[137] R. Mathevet, F. Bousquet, and C. Raymond, "The concept of stewardship in sustainability science and conservation biology," *Biol Conserv*, vol. 217, pp. 363–370, 2018, doi: 10.1016/j.biocon.2017.10.015.

[138] N. Bennett *et al.*, "Environmental Stewardship: A Conceptual Review and Analytical Framework," *Environ Manage*, vol. 61, pp. 597–614, 2018, doi: 10.1007/s00267-017-0993-2.

[139] L. McLeod *et al.*, "Environmental stewardship: A systematic scoping review," *PLoS One*, vol. 19, p., 2024, doi: 10.1371/journal.pone.0284255.

[140] H. G. Firnando, "Murtadha Muthahhari Ecological Vision: Unveiling the Spiritual Foundation of Harmony Between Humans and Nature in Islamic Ecology," *HUMANIKA*, p., 2024, doi: 10.14710/humanika.v30i2.59354.

[141] S. Basri, Y. Adnan, L. Widiastuty, M. A. Syamsul, and I. Indar, "Islamic Environmental Ethics: A Cultural Framework for Sustainable Resource Management and Global Ecological Stewardship," *Diversity: Disease Preventive of Research Integrity*, p., 2024, doi: 10.24252/diversity.v5i2.52342.

[142] R. Falkner and B. Buzan, "The emergence of environmental stewardship as a primary institution of global international society," *Eur J Int Relat*, vol. 25, pp. 131–155, 2019, doi: 10.1177/1354066117741948.

[143] J. P. Enqvist, S. West, V. Masterson, L. Haider, U. Svedin, and M. Tengö, "Stewardship as a boundary object for sustainability research: Linking care, knowledge and agency," *Landsc Urban Plan*, p., 2018, doi: 10.1016/j.landurbplan.2018.07.005.

[144] S. Abbas, A. Nasim, J. Syawal, and I. Fahri, "Designing a Basic Natural Science E-Module: Integrating Eco-Socioscience and Maqasid Shariah for Non-Science Learners," *AL-ISHLAH: Jurnal Pendidikan*, p., 2025, doi: 10.35445/alishlah.v17i2.6691.

[145] A. Goodale, M. Gilmore, and B. Griffiths, "21st-century stewardship: infusing environmental stewardship education with global citizenship," *Environ Educ Res*, vol. 31, pp. 364–389, 2024, doi: 10.1080/13504622.2024.2335614.

[146] A. Rakhmat, "ISLAMIC ECOTHEOLOGY: UNDERSTANDING THE CONCEPT OF KHALIFAH AND THE ETHICAL RESPONSIBILITY OF THE ENVIRONMENT," *Academic Journal of Islamic Principles and Philosophy*, p., 2022, doi: 10.22515/ajipp.v3i1.5104.

[147] E. Pandikar, I. Affandi, D. Disman, and D. Sundawa, "Harmonizing Economic Principles, Islamic Values, and Entrepreneurial Attitudes for a Sustainable Environment," *Yupa: Historical Studies Journal*, p., 2024, doi: 10.30872/yupa.v6i2.3739.

[148] P. Nilan, "Muslim youth environmentalists in Indonesia," *J Youth Stud*, vol. 24, pp. 925–940, 2020, doi: 10.1080/13676261.2020.1782864.

[149] F. Mufid, A. R. Nugraha, and D. Shobaruddin, "Islamic Education and Sustainable Development: Bridging Faith and Global Goals," *International Journal of Social and Human*, p., 2024, doi: 10.59613/j107r533.

[150] L. A. Bsoul, A. Omer, L. Kucukalic, and R. Archbold, "Islam's Perspective on Environmental Sustainability: A Conceptual Analysis," *Soc Sci*, p., 2022, doi: 10.3390/socsci11060228.

[151] I. Malik, S. S. Karimullah, H. Okur, and Rahman, "Gender Analysis in the Islamic Law-Based Ecofeminism Movement for Ecosystem Protection," *El-Mashlahah*, p., 2025, doi: 10.23971/el-mashlahah.v15i1.9040.

[152] K. Khotimah, M. Taembo, M. Hipni, and W. Lutfitasari, "Sustainable Character Formation in Eco-Pesantren: a Linguistic and Spiritual Ecology Perspective Under the SDGs Framework," *Journal of Lifestyle and SDGs Review*, p., 2024, doi: 10.47172/2965-730x.sdgsreview.v5.n01.pe02519.

[153] Mohd. M. Khan, M. Begum, A. Anees, and A. Mishra, "Addressing environmental stewardship: prophetic perspectives on sustainability and conservation," *International Journal of Zoology, Environment and Life Sciences*, p., 2024, doi: 10.70604//ijzels.v1i2.22.

[154] T. Yuniartin, S. Subaidah, D. Feriana, M. Arman, and D. Saepuloh, "Evaluation of Islamic Education: Integrating Cognitive, Moral, and Spiritual Aspects Based on The Qur'an and Hadith," *Jurnal Pendidikan Agama Islam Indonesia (JPAII)*, p., 2024, doi: 10.37251/jpaii.v5i4.1267.

[155] H. C. A. Kistoro, E. Latipah, and N. Burhan, "Probing Experiential Learning Approach in Islamic Religious Education," *Jurnal Pendidikan Islam*, p., 2023, doi: 10.15575/jpi.v9i2.24374.

[156] A. Purwanto, "Problems in the Management of Islamic Religious Education in Schools and Universities," *JUPE : Jurnal Pendidikan Mandala*, p., 2024, doi: 10.58258/jupe.v9i4.7788.

[157] S. Susmiyati, Z. Zurqoni, M. H. Abdillah, and W. Saugi, "Challenges of Affective Assessment of Islamic Religious Education Learning in Merdeka Curriculum," *Al-Hayat: Journal of Islamic Education*, p., 2023, doi: 10.35723/ajie.v7i2.675.

[158] Y. F. Warosari, J. Mahanis, and N. Alia, "The Impact of Teacher Competence on Inclusive Education: Moderating Role of Islamic Religious Education Understanding," *Ta'dib*, p., 2025, doi: 10.31958/jt.v28i1.15183.

[159] A. Hadziq, "Diagnostic Assessment of Islamic Education Learning in Merdeka Curriculum: A Systematic Review," *Al-Misbah (Jurnal Islamic Studies)*, p., 2023, doi: 10.26555/almisbah.v11i1.8392.

[160] F. Ulfat, "Empirical research: Challenges and impulses for Islamic religious education," *British Journal of Religious Education*, vol. 42, pp. 415–423, 2020, doi: 10.1080/01416200.2020.1711513.

[161] A. Kosasih, T. Supriyadi, Mokh. I. Firmansyah, and N. Rahminawati, "Higher-Order Thinking Skills in Primary School: Teachers' Perceptions of Islamic Education," *Journal of Ethnic and Cultural Studies*, p., 2021, doi: 10.29333/ejecs/994.

[162] P. T. Raniya, T. A. Silmi, K. Kusaeri, S. Suparto, and S. I. Malyuna, "Neuroeducational Assessment Design of Islamic Religious Education in the Era of Society 5.0," *Scaffolding: Jurnal Pendidikan Islam dan Multikulturalisme*, p., 2025, doi: 10.37680/scaffolding.v7i1.7286.

[163] S. A. Samad, S. Gade, H. Basri, and S. Ariani, "Teacher's Spiritual Competence and Its Implicatioan in Islamic Relgious Education Learning in Pidie, Aceh," *Ulumuna*, p., 2023, doi: 10.20414/ujis.v27i2.710.

[164] N. A. Rahman, "Competency-Based and Ethical Assessment Models in Contemporary Islamic Pedagogy," *Sinergi International Journal of Islamic Studies*, p., 2025, doi: 10.61194/ijis.v3i1.710.

[165] M. Kosim, "Analysis of Environmental Education Materials in Islamic Religious Education and Character Textbook for Senior High School," *TADRIS: Jurnal Pendidikan Islam*, p., 2022, doi: 10.19105/tjpi.v17i1.5918.

[166] S. R. Hafiz, A. F. Nasution, W. Rahayu, Muliadi, and C. M. Sitompul, "Teacher Problems in Implementing the Independent Curriculum in Islamic Religious Education Subjects," *COMPETITIVE: Journal of Education*, p., 2024, doi: 10.58355/competitive.v3i1.38.

[167] Abd. Rohim and M. Y. Al Madzaly, "ANALYSIS OF EVALUATION TECHNIQUES IN THE BOOK 'ISLAMIC RELIGIOUS EDUCATION AND ETHICS' FOR ELEVENTH GRADE STUDENTS OF MADRASAH ALIYAH," *Edukasi Islami: Jurnal Pendidikan Islam*, p., 2025, doi: 10.30868/ei.v14i01.8054.

[168] G. H. Achmad and A. Prastowo, "Authentic Assessment Techniques on Cognitive Aspects in Islamic Religious Education Learning at Elementary School Level," *Jurnal Ilmiah Sekolah Dasar*, p., 2022, doi: 10.23887/jisd.v6i1.42636.

[169] M. Ramadhan, N. Anas, and U. Jayanti, "PENGEMBANGAN MODUL PERUBAHAN LINGKUNGAN MELALUI MODEL THINK PAIR SHARE TERINTEGRASIKAN NILAI-NILAI ISLAM UNTUK MENINGKATKAN HASIL BELAJAR SISWA," *BIOEDUKASI (Jurnal Pendidikan Biologi)*, p., 2023, doi: 10.24127/bioedukasi.v14i2.8182.

[170] I. Wahyu and N. Inayati, "The Role of Islamic Religious Education Teachers as a Model of Character Education in SMK Negeri 1 Sambirejo," *Electronic Journal of Education, Social Economics and Technology*, p., 2025, doi: 10.33122/ejeset.v6i1.622.

[171] M. Ikhwan, M. Ghazali, F. Hidayati, R. H. Agustina, and Gusti, "Sosialisasi Modul 'Hukum Islam dan Lingkungan' untuk Meningkatkan Pemahaman Menjaga Lingkungan Hidup dan Keberlanjutan Alam," *NAJWA: Jurnal Pengabdian dan Pemberdayaan Masyarakat*, p., 2025, doi: 10.30762/najwa.v3i1.457.

[172] A. Anton, H. M. Ilyas, and M. S. N. Firdaus, "Pendekatan Desain Kolaboratif dalam Upaya Mengembangkan Program Ekstrakurikuler Sekolah Dasar," *Jurnal Bersama Ilmu Pendidikan (DIDIK)*, p., 2025, doi: 10.55123/didik.v1i1.9.

[173] Q. Y. Zaqiah, A. Hasanah, Y. Heryati, and R. Rohmatulloh, "The Impact of In-Service Teacher Education Program on Competency Improvement Among Islamic Religious Education Teachers Using Self-Assessment," *Educ Sci (Basel)*, p., 2024, doi: 10.3390/educsci14111257.

[174] R. Naumi, S. Suriana, and U. Nazila, "Transformation of Islamic Religious Education (PAI) Learning through an Emotional Approach," *ISTIFHAM: Journal Of Islamic Studies*, p., 2025, doi: 10.71039/istifham.v3i1.96.

[175] D. Sulistyowati, W. Wahab, and S. S. Prabowo, "The Resilience Of E-Learning Based Merdeka Curriculum Training Effectiveness For Islamic Religious Education Teachers In Improving Learning Quality At Man Landak," *IJGIE (International Journal of Graduate of Islamic Education)*, p., 2025, doi: 10.37567/ijgie.v6i1.3841.

[176] A. A. Rochim, A. Khayati, and A. Info, "Role of Islamic Education Teachers in Shaping Students' Religious Character in the Digital Era: A Case Study of SDN 1 Kondangsari, Cirebon," *HEUTAGOGIA: Journal of Islamic Education*, p., 2023, doi: 10.14421/hjie.2023.32-10.

[177] S. Sahri and S. Aziz, "The Role Of Islamic Education Teachers In Increasing Social Awareness And Environmental Awareness In The Young Generation," *AL-WIJDĀN Journal of Islamic Education Studies*, p., 2023, doi: 10.58788/alwijdn.v8i4.2973.

[178] Irawan, Akil, and A. Nurlaeli, "Implementation of Islamic Religious Education Governance in Forming Environmentally Concerned Characters at State High School 5 Karawang," *ENDLESS : International Journal of Future Studies*, p., 2021, doi: 10.54783/endless.v4i2.71.

[179] Z. Abdullah, P. R. D. Kusumawati, A. Khofifah, and N. A. L. Ni'mah, "Development of environmental sustainability handout based on STEM-PjBL integrated islamic values," *Jurnal Biolokus*, p., 2024, doi: 10.30821/biolokus.v7i1.3402.

[180] I. Fatmawati, A. N. Kayati, M. Taembo, and P. R. Ningsih, "The Implementations and Strategies of Learning Based on Ecoliteracy in Boarding Schools in Reaching SDG for Classy Education," *Journal of Lifestyle and SDGs Review*, p., 2025, doi: 10.47172/2965-730x.sdgsreview.v5.n02.pe03689.

[181] R. Muzayanah, "Teacher Education for the Improving Professionalism of Islamic Religious Education Teachers in Lamongan Regency," *EDU-RELIGIA : Jurnal Keagamaan dan Pembelajarannya*, p., 2025, doi: 10.52166/edu-religia.v8i1.9406.

[182] N. Roisatulkusna and N. Hakim, "DEVELOPMENT OF AN INTEGRATED E-BOOKLET I-SETS (ISLAMIC, SCIENCE, ENVIRONMENT, TECHNOLOGY, AND SOCIETY) ENVIRONMENTAL CHANGE MATERIAL FOR CLASS X SMA/MA STUDENTS," *Quantum: Jurnal Inovasi Pendidikan Sains*, p., 2024, doi: 10.20527/quantum.v15i1.18372.

[183] D. Hijrotin, "The Role of Islamic Religious Education Curriculum in Shaping Students' Morals and Ethics at Junior High School," *AFKARINA: Jurnal Pendidikan Agama Islam*, p., 2023, doi: 10.33650/afkarina.v8i2.9398.