

Ekopesantren: An Ecology-Based Education Model with Local Wisdom Supports the Sustainable Development Goal's

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ABSTRACT

This study investigates an ecology-based education model incorporating local wisdom to support Sustainable Development Goals (SDGs) in Islamic boarding schools (pesantren). The research focuses on Al-Ashriyyah Nurul Iman Islamic Boarding School in Bogor, Indonesia, examining its approach to sustainability within an Islamic educational framework. A qualitative research approach was employed, utilizing semi-structured interviews, observations, and document analysis. Informants included school leaders, students, teachers, staff, the eco-pesantren team, and the surrounding community. Data were analyzed using qualitative descriptive techniques and triangulation to ensure reliability. Findings indicate that Al-Ashriyyah Nurul Iman Ecopesantren integrates Islamic values, local wisdom, and sustainability principles through a holistic educational model. This includes an environment-based curriculum, inclusive community engagement, eco-friendly campus management, a sustainability culture, and circular economy practices. The pesantren applies local wisdom values such as *silih asih* (mutual care) and reciprocal nurturing, positioning students as key agents of sustainable transformation. Through circular economy initiatives, students actively contribute to sustainability by converting waste into productive resources. These efforts align with multiple SDGs, including SDG1 (No Poverty), SDG2 (Zero Hunger), SDG3 (Good Health and Well-being), SDG4 (Quality Education), SDG5 (Gender Equality), SDG6 (Clean Water and Sanitation), SDG7 (Affordable and Clean Energy), SDG13 (Climate Action), and SDG17 (Partnerships for the Goals). The integration of ecological education and local wisdom in Islamic boarding schools fosters sustainability and enhances student participation in achieving SDGs, demonstrating the potential of pesantren as models for sustainable education.

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1. INTRODUCTION

The Sustainable Development Goals (SDGs) are a comprehensive framework outlined by the United Nations to address global challenges and achieve sustainable development by 2030 (Lynch et al., 2020). The SDGs are a global and national commitment in an effort to improve the welfare of the community covering 17 goals, including poverty alleviation, quality education, and environmental sustainability, which are designed to improve human and environmental welfare (BAPPENAS, 2020).

It is undeniable that environmental problems have reached an important point and continue to develop rapidly in the 21st century (Arslan, 2012: 903), especially in the midst of the development of the Industrial Revolution 4.0 as it is today (Taufik, 2020: 83). Global challenges that are significantly facing humans, such as climate change, environmental damage, food shortages, social inequality, discrimination, as well as the current pandemic, hinder the achievement of sustainable development goals at the micro-organizational scale as well as the macro-scale of countries and multinationals (Helfaya & Aboud, 2023).

Globally, environmental problems are faced with three main problems, namely (Fachruddin M. Mangunjaya, 2014): 1) degradation of natural resources, 2) pollution, and 3) global warming. On the other hand, the phenomenon of environmental degradation is a problematic landscape that causes three gaps, namely *the ecological divide; the social divide; and the spiritual divide* (Scharmer, 2018: 17; Cahyadi, 2020). The *Millenium Ecosystem Assessment* (MEA) report even mentions that in the next 50 years the damage will be worse and increasing (Jones et al., 2017: 2). These global challenges demand immediate action and cross-sector collaboration. Education plays an important role in supporting the SDGs through increased awareness, community participation, and instilling sustainability values, with the environment-based education model being a strategic step to achieve these global goals

Indonesia as a country with the largest Muslim population in the world, has the strength and opportunity to support the optimization of SDGs achievements through eco-pesantren activities. Ecopesantren is an educational model that integrates Islamic values, local wisdom, and environmental education to support sustainability (Suryanto, 2019). Although eco-pesantren is promoted as an integrative education model that combines religious values with environmental sustainability, the active participation of pesantren in Indonesia is still relatively low (Herdiansyah et al., 2019). Many pesantren face obstacles such as limited resources, lack of training, and resistance to change, which makes them reluctant to adopt this approach voluntarily (Bakri, 2021). More intensive support is needed to encourage wider adoption, such as incentive programs, the provision of supporting facilities, and increased awareness of the long-term benefits of the eco-pesantren model for education and the environment.

Al Ashriyyah Nurul Iman Islamic Boarding School as one of the pioneers of eco-pesantren in Indonesia shows how ecology-based education combined with local wisdom can contribute significantly to the achievement of the SDGs, especially in the aspects of environmental sustainability, economic empowerment, and quality education. By combining Islamic boarding schools values such as the Prophet's morals (*siddiq, amanah, tabligh, fathonah*) and local Sundanese wisdom values such as *silih asah, silih asih, and silih fosuh*, this ecopesantren not only teaches environmental awareness but also forms the character of students who are *cageur, bageur, smart, bener, and singer* (Sitika et al., 2021). This holistic approach translates into real-world practices such as waste management, water conservation, and the use of renewable energy based on local spirituality, ethics, and cultural values, making it an educational model in line with the SDGs.

Along with the challenges and opportunities faced by eco-pesantren in supporting the SDGs, many pesantren in rural areas have great potential to develop local culture as part of sustainability efforts. Local culture, which is loaded with traditional wisdom values, such as harmony with nature, mutual cooperation, and respect for the environment, can be a strong basis to support the global agenda of the SDGs if integrated in the education model. Therefore, socializing the eco-pesantren education model based on local wisdom is a strategic step to strengthen awareness and sustainability practices among pesantren and the surrounding community. By combining religious teachings, local cultural

values, and sustainability principles, eco-pesantren can be an effective catalyst for change in responding to global challenges while preserving Indonesia's cultural heritage. It is hoped that the findings of this study will provide positive input for the existence of Islamic boarding schools as an educational model that can be used as a solution in the midst of sustainable efforts to overcome global issues such as climate change, environmental damage crises, poverty alleviation, health, education, and inequality.

2. METHODS

This research is a research field with a qualitative approach that focuses on exploring and understanding the complexity of human behavior, experiences, and phenomena through non-numerical data such as words, images, and observations (Muhamad Taufik, 2020; Sitika et al., 2021; Wahyudin, 2022). The researcher seeks to uncover the meaning and context behind various phenomena of ecological education activities based on local wisdom in the pesantren in an effort to sustainably support the SDGs according to the capacity and needs of the pesantren.

This research was carried out at an eco-boarding school institution, namely the Al-Ashriyyah Nurul Iman Islamic boarding school in Bogor. Data collection uses techniques such as interviews, observations, and document studies to gather rich and detailed insights. The interview involved leaders, students, teachers/lecturers, employees, the pesantren eco-team, and the community. Documentation includes various reports, research journals, web searches and other relevant document collections. Observations are carried out to obtain objective and empirical realities of Islamic boarding school activities that support the SDGs both directly and indirectly. Data were collected and analyzed using qualitative descriptive and triangulation techniques to obtain accurate and accountable data by matching data obtained through interviews, documentation and observation (Sittika et al., 2022).

3. FINDINGS AND DISCUSSION

3.1. Findings

Ecopesantren is terminologically composed of two words, namely: eco comes from the word "ecology" which means the environment (Khairani & Fauzi, 2023), and the word "pesantren" which means an Islamic educational institution with the characteristics of boarding led by a ulama or kiyai (Aisyah et al., 2022). *Ecopesantren* are deeply rooted in Islamic traditions, providing a holistic approach to education by integrating environmental sustainability practices and teachings into their curriculum (Pujianto et al., 2021). In the author's opinion, *Ekopesantren* is an educational concept that combines religion-based education with sustainability values, including environmental preservation and local economic empowerment. In its implementation, the *ecopesantren* not only focuses on Islamic-based education but also instills ecological awareness through programs such as waste management, organic agriculture, and the use of renewable energy, which make students one of the main actors in transformation.

Mangunjaya & Wahyono (2022: 18) explained the programs that can be implemented by the Islamic Boarding School, namely the "10 Eco Pesantren Programs" which consist of: a) Environment-Based Curriculum Programs; b) Environmental Fiqh Lesson Integration Program; c) Human resource improvement program in the environmental sector; d) Islamic Boarding School Land Program; e) Water Resources; f) Healthy Living Program; g) Waste and Waste Program; h) Resources and Energy Program; i) Transportation Program; and j) Biodiversity Program. Meanwhile, Jones et al (2020) facilitated extensive and in-depth consultation in formulating eco-pesantren Sustainability Policies and Action Plans based on the holistic model of the "4Cs," namely *Curriculum*, *Campus*, *Community*, and *Culture* (Institutional Culture), which is interrelated and complementary that helps the pesantren become a sustainable educational institution.

By adapting to the educational concepts of Jones et al (2020) and Mangunjaya & Wahyono (2022: 18) above, the findings regarding the eco-pesantren education model at the Al Ashriyyah Nurul Iman Islamic Boarding School in supporting sustainable development goals, are studied in 5 main aspects including: 1) Curriculum and Educational Programs; 2) campuses; 3) community; 4) culture and 5) circular economy. As for focusing on the study of support for the SDGs, it is focused on 9 aspects of the SDGs, including: a) SDG1 (No Poverty); 2) SDG2 (No Hunger); 3) SDG3 (Healthy and Prosperous Life); 4) SDG4 (Quality Education); 5) SDG5 (Gender Equality); 6) SDG6 (Clean Water and Proper Sanitation); 7) SDG7 (Clean and Affordable Energy); 8) SDG13 (Climate Change Management); and 9) SDG17 (Partnerships to Achieve the Goals).

Ecology education at Al Ashriyyah Nurul Iman Islamic Boarding School is developed based on local wisdom supported by circular economy entrepreneurship which plays an important role in supporting the Sustainable Development Goals (SDGs) by fostering a mindset that integrates sustainability principles. Based on the findings and data analysis, we try to develop a design of an eco-pesantren education model based on the following findings:

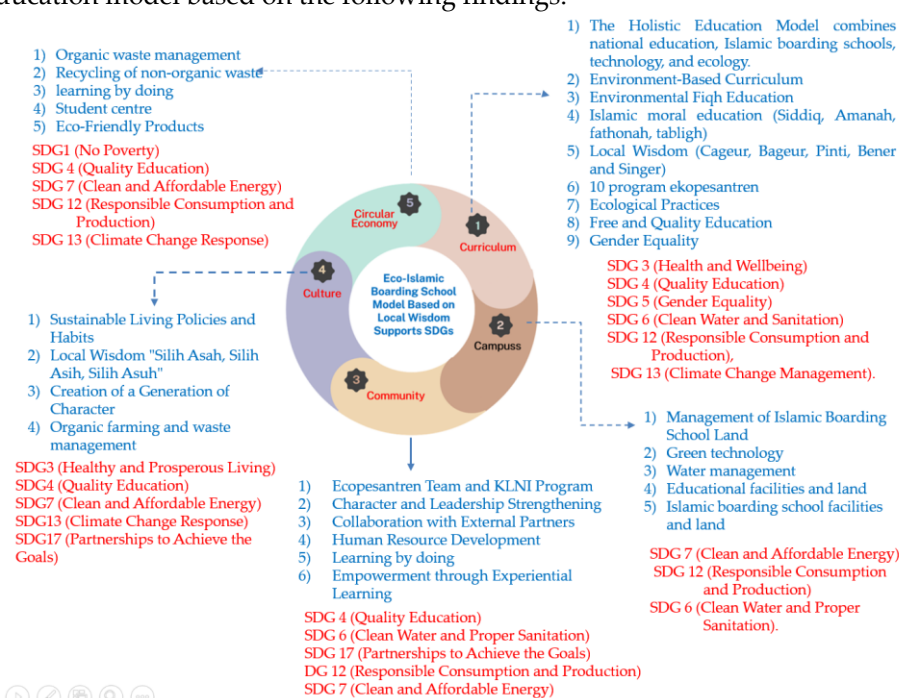


Figure 1. Ecology-Based Education Model with Local Wisdom Supports Sustainable Development Goal's at Al Ashriyyah Nurul Iman Ecopesantren Bogor

3.1.1 Curriculum and Education Program of Ecopesantren

Nurul Iman Islamic Boarding School implements an Environment-Based Curriculum by integrating ecological awareness into all subjects, including science and *fiqh*, while linking lessons to Qur'anic teachings. The school follows a holistic education model that blends national education, Islamic boarding school traditions, technology, and ecology, all rooted in Islamic values and simplicity. Upholding the principle of "*al-muhafadzah 'ala qadim as-shalih wa al-akhdzu bi al-jadid al-ashlah*," it preserves valuable traditions while embracing innovations to address globalization and environmental challenges. The curriculum combines religious, national, and environmental education, supporting the Sustainable Development Goals (SDGs) by reinforcing students' role as stewards of the earth.

According to Sulaeman et al (2021) through an approach that integrates national education, Islamic boarding schools, technology and ecology with Islamic values and typical wisdom of Islamic boarding schools, students are not only taught academic and religious knowledge, but also the importance of protecting the environment, which is integrated in all subjects, including science and *fiqh*, so that they can understand their responsibilities as the caliph of the earth. The impact of this process can be seen

in the formation of the character of students who are more concerned about the environment and have an awareness of sustainability, which is part of Islamic teachings, as well as the ability to apply these principles in daily life (Zuhriy, 2011; baihaki, 2020). Thus, education in Islamic boarding schools not only focuses on cognitive aspects, but also on the development of attitudes and behaviors that reflect strong moral and ethical values.

Islamic boarding schools are synonymous with learning fiqh, the yellow book and in-depth Islamic studies as the identity of local wisdom typical of Islamic boarding schools (Aisyah et al., 2022; Lathifah et al., 2022). The students of the Al-Ashriyyah Nurul Iman Islamic Boarding School not only learn about the fiqh of worship, but also learn about environmental fiqh. One of the environmental fiqh is studied by relating worship activities to the nature of environmental mutualism. For example, Muslims must perform ablution with holy and clean water, so it is important to preserve the spring by also maintaining plants and soil as water absorbers so that ecocentrism occurs between humans and the environment. According to Aulia et al (2020), the Environmental Fiqh Lesson Integration Program strengthens Islamic values about human responsibility as the earth's caliph in resource management, where students are taught the principles of sustainability based on religious teachings to be applied in daily life.

The local wisdom developed at the Al Ashriyyah Nurul Iman Islamic Boarding School in the form of internalization of Islamic educational values such as *siddiq*, *fathonah*, *amanah*, and *tabligh* is the basis for building the character of students who are disciplined, independent, and contribute to sustainable development. Not only that, the curriculum and educational programs at the Al-Ashriyyah Nurul Iman Islamic Boarding School are designed to preserve the local wisdom values of the Sundanese West Javanese community by forming students who are "cageur, bageur, smart, right, and singer" (healthy, good, smart, correct, and tough). These values are integrated through religious and general education based on daily practices, such as maintaining a clean environment, organic farming, and local culture-based life skills. The concept of "cageur" is realized by instilling a healthy lifestyle through nutritious food based on local products and personal hygiene; "Bageur" is instilled through noble moral education and the habit of mutual cooperation in daily activities; "smart" is realized through the integration of religious science and modern technology in the curriculum; "right" is applied by instilling honesty and responsibility through learning based on Islamic values; and "Singer" (tough) is formed through challenge-based learning and entrepreneurship that trains students to be independent and resilient to various situations.

With the motto "Free and quality education supported by social entrepreneurship," pesantren provides quality education, health, lodging and free meals by instilling spiritual values, local wisdom, entrepreneurship, and environmental conservation in an integrative manner. The visions and missions of the pesantren and educational programs direct students to become individuals with noble character, innovative, and responsible, with competence to preserve the environment while building society. Pesantren is able to provide quality free education while involving students in environment-based entrepreneurial practices, such as waste management, organic farming, and the use of renewable energy. The implementation of education at the Nurul Iman Islamic Boarding School is in line with Dwi's (2023) view that eco-pesantren education should indeed be directed at the formation of a dynamic and strong generation of students in facing the challenges of globalization and environmental issues while still adhering to spiritual values.

Research by Nurdin & Rasyid (2022) shows that pesantren are effective in instilling a sense of responsibility for the environment through a structured curriculum that emphasizes religious and ecological education. In line with Nurdin & Rasyid (2022), through classroom learning activities, routine recitations, sermons and spiritual activities, Nurul Iman students study in depth sharia laws to solve various problems that occur in the midst of the interaction process between living beings and their neighbors and their environment. Activities such as "Clean Friday" and cleanliness competitions not only increase environmental awareness but also produce students who are more disciplined, independent, and environmentally conscious. All students, both male and female, have the same

opportunities and rights in education, self-development and leadership that reflect gender equality. By implementing environment-based curriculum programs and learning environmental fiqh in line with SDG 3 (Healthy and Prosperous Living), SDG 4 (quality education), SDG 5 (gender equality), SDG 6 (Clean Water and Proper Sanitation), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Change Management).

3.1.2 Campus

Al Ashriyyah Nurul Iman Islamic Boarding School prioritizes campus design that supports environmentally friendly principles as part of its commitment to environmental conservation and the achievement of the Sustainable Development Goals (SDGs). The total land managed is 38 hectares, with 13 hectares for formal education campus land and Islamic boarding schools. Meanwhile, the remaining 25 hectares were developed for organic agriculture, livestock, and fisheries as part of a practical curriculum that teaches natural resource management skills to students. Green technologies such as solar panels and biogas systems from organic waste are used to supply renewable energy, supporting SDG 7 (Clean and Affordable Energy) as well as SDG 12 (Responsible Consumption and Production). In addition, clean water management with reverse osmosis technology and the use of ablution residual water for irrigation show the pesantren's commitment to SDG 6 (Clean Water and Proper Sanitation).

The approach to campus management at the Al Ashriyyah Nurul Iman Islamic Boarding School in the context of pedagogy as viewed by Khoirunnisak et al (2023), not only includes teaching about the importance of protecting the environment, but also the application of sustainable practices in the daily lives of students, such as the use of renewable energy and efficient waste management. Initiatives in organic farming not only promote ecological balance but also serve as a model for sustainable practices that can be replicated in a broader context. Research by Li et al. (2022) has shown that education plays an important role in increasing farmers' willingness to adopt green technologies, thereby contributing to the sustainability of the overall agricultural system. By providing students with hands-on experience in the field of campus and eco-pesantren land management, in line with Pal (2023), the school is growing future leaders in sustainable agriculture and contributing to the broader goals of environmental sustainability and resource efficiency.

3.1.3 Community

The community at the Al Ashriyyah Nurul Iman Islamic Boarding School plays a strategic role in supporting the achievement of the Sustainable Development Goals (SDGs) through collaboration and active involvement of all parties. Community in this concept is related to the eco-pesantren team, human resource development and partnership/networking community. The community, the eco-pesantren team, and the KLNI (Nurul Iman Environmental Cleanliness) program at the Al Ashriyyah Nurul Iman Islamic Boarding School play a key role in supporting the SDGs by building environmental awareness and responsibility among students. The eco-pesantren team, which consists of students, teachers, and pesantren leaders, is actively involved in environmental management, including daily cleanliness, waste recycling, and the management of renewable energy such as biogas.

The KLNI program specifically instills environmental discipline with strict rules, such as smoking bans and fines for hygiene violations. This activity not only encourages environmentally friendly behavior but also builds the character of students who are disciplined, independent, and responsible, in accordance with Islamic values and sustainability principles. The pesantren community also plays a role as "social engineering," creating a generation of students who are environmentally conscious and able to become future leaders who care about nature conservation.

Pesantren builds an inclusive community by involving students, teachers, leaders, and external partners such as government agencies, NGOs, and international institutions in support of SDG 17 (Partnership to Achieve the Goals). Collaboration can improve the educational framework by integrating diverse perspectives, resources, and expertise, thereby enriching the curriculum and providing students with a more comprehensive understanding of sustainability issues (Finger et al.,

2021). These communities and collaborations support the implementation of eco-pesantren programs through practical activities such as organic waste management, organic farming, and the application of renewable energy, which directly contribute to SDG 12 (Responsible Consumption and Production) and SDG 7 (Clean and Affordable Energy). In addition, the development of networks with the Tzu Chi Buddhist Foundation and international collaborations such as the provision of Disactivated Carbon Filter technology for clean water create long-term benefits for the pesantren community and support SDG 6 (Clean Water and Proper Sanitation).

In human resource development, pesantren provides diverse training to improve students' skills in the fields of environment, entrepreneurship, and technology. This training includes waste management, maggot cultivation, foreign languages, and entrepreneurship based on social entrepreneurship that supports the economic independence of Islamic boarding schools. The learning by doing approach is applied to equip students with practical skills that are relevant to future needs, supporting SDG 4 (Quality Education). With values such as *siddiq*, *amanah*, and *fathonah* instilled through practice-based learning and exemplary leadership, pesantren has succeeded in producing a generation that is not only intellectually intelligent, but also has high environmental awareness and social responsibility.

The development of human resources (HR) at this pesantren prioritizes *the learning by doing* method, where students learn through direct experience in various daily activities, including maintaining the cleanliness and neatness of the environment. This approach teaches students practical skills that are relevant to life, such as time management, teamwork, and responsibility. In addition, a senior-junior tutor learning system is also applied, where senior students guide juniors in carrying out certain tasks. This system not only accelerates the transfer of knowledge, but also builds leadership, exemplary attitudes, and respect among students. This approach makes pesantren a holistic learning environment, combining theoretical learning with real practice in daily life.

3.1.4 Culture

The eco-pesantren culture at the Al Ashriyyah Nurul Iman Islamic Boarding School includes sustainable living policies and habits designed within the framework of local wisdom "*silih asah, silih asih, silih fosuh*" as well as Islamic values. Policies such as smoking bans, fines for hygiene violations, and organic waste management are part of the discipline to build environmental awareness. Habits such as "Clean Friday" activities, garbage recycling, and the use of renewable energy such as biogas reflect human responsibility as the caliph on earth, as taught in Islam. Values such as *siddiq* (honest), *amanah* (responsible), and *fathonah* (smart) are applied through practice-based education to realize students who are disciplined and care for the environment.

In the context of local wisdom, the principle of "*silih asah*" encourages students to share knowledge with each other, "*silih asih*" builds a sense of affection and care between pesantren residents, and "*silih asuh*" fosters a sense of shared responsibility in protecting the environment. This combination of local wisdom and Islamic values aims to create a generation of students who are *cageur* (healthy), *bageur* (good), *smart* (intelligent), *true* (correct), and *singer* (responsive). Ecopesantren programs such as organic agriculture and waste management become a forum for practice to instill these values, producing students who are not only intellectually intelligent but also have a strong character in maintaining environmental sustainability and building a harmonious community.

Al Ashriyyah Nurul Iman Islamic Boarding School educates about the benefits of sustainable transportation and the provision of supporting infrastructure. This program aims to create an environmentally friendly transportation culture, reduce fossil fuel consumption, and create positive environmental awareness among Islamic boarding school members. Thus, although the environmentally friendly transportation program has not been fully realized in the form of the use of emission-free vehicles, the transportation program in the eco-pesantren can play a role in promoting a sustainable and caring lifestyle.

3.1.5 Circular Economy

The circular economy at the Al-Ashriyyah Nurul Iman Islamic Boarding School focuses on waste management to generate added value through recycling practices and the use of renewable energy. Organic waste from the pesantren kitchen is processed into compost and biogas, which are used for cooking in public kitchens. In addition, non-organic waste such as plastic is recycled into paving blocks that are sold as pesantren products. This activity involves students in the production process, starting from the collection of raw materials, processing, to marketing, so as to instill practical skills as well as the value of environmental responsibility.

The involvement of students in the circular economy system not only improves their skills, but also builds the character of independence and caring for the environment. The students are trained through a "*learning by doing*" approach, which allows them to understand the concept of sustainability in the context of daily life. Waste management products, such as organic fertilizers, paving blocks, and biogas energy, are clear evidence of the success of Islamic boarding schools in implementing a circular economy. This supports quality education (SDG 4) while encouraging responsible consumption and production (SDG 12).

The impact of the implementation of this circular economy can be seen in the increase in resource use efficiency and significant waste reduction. Waste that was previously unmanaged is now a source of energy and production materials that support the needs of Islamic boarding schools. The output in the form of environmentally friendly products, such as compost and paving blocks, not only meets the internal needs of the pesantren, but also provides additional income that supports free education operations. The broader outcome is the creation of ecological awareness among students and the surrounding community.

The contribution of the circular economy to education and the economy of Islamic boarding schools is very significant. In addition to supporting the sustainability of free education up to the S3 level, this activity also creates jobs for students and local residents, supporting local economic growth. By using resources wisely, pesantren not only reduces operational costs, but also serves as a model for other communities in implementing sustainability practices that are in line with the SDGs, especially SDG 7 (Clean and Affordable Energy), SDG 12, and SDG 13 (Climate Change Management).

Entrepreneurship education through the circular economy has been shown to improve entrepreneurial mindsets among students, which can play an important role in encouraging environmentally conscious business practices (Handayati et al., 2020). By connecting entrepreneurship education with green entrepreneurial behavior, Al Ashriyyah Nurul Iman Islamic boarding school encourages students, teachers, employees and members of the surrounding community to commit to environmental sustainability, thereby leading to environmentally friendly business practices and behaviors that are in line with the SDGs. In addition, the incorporation of Islamic values in entrepreneurship education in eco-boarding schools provides a unique perspective that emphasizes ethical business practices and sustainable, contributing to increased environmental awareness and responsibility among students.

Furthermore, the Al Ashriyyah Nurul Iman Islamic Boarding School empowers students through entrepreneurship education based on local wisdom, fostering leadership qualities, developing human resources, and a sense of responsibility for the environment. Students are equipped with the knowledge and skills to create sustainable businesses that contribute positively to the environment and society. Through the experiential learning approach and eco-literacy development, students are encouraged to implement clean and healthy living behaviors, engage in waste management activities, and participate in environmental conservation efforts, thereby encouraging sustainable practices and supporting the SDGs.

The healthy living program at the Al-Ashriyyah Nurul Iman Islamic Boarding School integrates a healthy lifestyle based on religious teachings with holistic healthy living practices. In this context, the program includes aspects such as a healthy diet in accordance with religious teachings, regular exercise, physical activity, maintenance of environmental cleanliness, and promotion of spiritual mental health.

In addition, eco-pesantren can also include practices such as organic farming to provide healthy food, the use of natural medicines, and the provision of health facilities and health education for pesantren members. Through the activities of the healthy living program, the pesantren contributes to SDG 3 (Healthy and Prosperous Life) and SDG 5 (Gender Equality).

The Waste and Waste Program is carried out through a waste recycling business unit, which was the beginning of all business units in the Al Ashriyyah Nurul Iman Islamic Boarding School. This Waste Recycling Business Unit was established in 1998 since the foundation was established. The waste and garbage program in the eco-pesantren involves responsible and sustainable waste management. This includes the separation, recycling, and processing of organic and non-organic waste. Ecopesantren implements waste reduction programs through composting, the use of environmentally friendly products, and education on the importance of good waste management. The purpose of this program is to create a clean, healthy, and sustainable pesantren environment and teach the values of caring for the environment to its residents. The implementation of the waste and waste program in the pesantren contributes to SDG 3 (Healthy and Prosperous Life), SDG 8 (Decent Work and Economic Growth), SDG 13 (Climate Change Management) and SDG 15 (Terrestrial Ecosystems).

The Resources and Energy program in the pesantren includes strategies for managing energy and resources efficiently and sustainably. Biogas is a business unit that utilizes animal and human waste into fuel in the form of gas. The business unit was only formed in 2017. Meanwhile, the gas produced from the manure is in the form of methane gas which is environmentally friendly and harmless if operated and managed by Al Ashriyyah Nurul Iman, a female student. The biogas business unit plays a role in helping the economy of the Al Ashriyyah Nurul Iman Islamic Boarding School, because the gas produced from human and animal waste can be used in household industries such as the Nurul Iman Culinary business unit. The Resources and Energy Program in the Islamic boarding school contributes to SDG 1 (No Poverty), SDG 7 (Clean and Affordable Energy), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure), and SDG 12 (Responsible Consumption and Production).

3.2. Discussion

The establishment of a holistic curriculum that integrates national education, Islamic teachings, technology, and ecology as implemented at the Al Ashriyyah Nurul Iman Islamic Boarding School is very urgent to foster a generation of students who are not only academically capable but also environmentally conscious and socially responsible. This curriculum aims to instill Islamic values related to environmental management, especially through the study of environmental fiqh, which emphasizes the role of humans as caliphs on earth (Anabarja & Mubah, 2021). However, the implementation of such a curriculum faces several challenges, including resistance to changes in traditional educational frameworks, limited resources to train educators in an interdisciplinary approach, and the need for a comprehensive understanding of ecological principles and Islamic teachings among staff (Herdiansyah et al., 2016). Most importantly, while the integration of technology can improve learning experiences and engagement, it also raises concerns about the digital divide and equitable access to resources among students (Rouf et al., 2024). Furthermore, according to Marta-Lazo et al. (2019), the curriculum must be able to navigate the complexities of balancing religious teachings with contemporary environmental issues, ensuring that students are equipped to face real-world challenges while still adhering to their cultural and religious identities.

Syafei (2017) and Wasehudin et al. (2023) are of the view that moral education that is integrated with an approach based on local wisdom, such as the concept of "Cageur, Bageur, Pinter, Bener tur Singer," provides a strong foundation for students to develop sustainable and environmentally responsible living habits. However, Maduningtias (2022) admitted that the challenges faced in the implementation of this curriculum include resistance to changes from traditional educational methods, difficulties in integrating local values with modern educational principles, and the need to train educators to be able to teach these values effectively. Meanwhile, criticism of this approach was

expressed by Rohman (2017) that often this approach focuses on the potential gap between theory and practice, where the values taught may not always be reflected in the daily behavior of students. However, support for a value-based approach of local wisdom in eco-pesantren education emerged from the nation of Kejora et al (2021), with this holistic approach, pesantren not only maintains local wisdom but also forms a generation that is ready to face global challenges with strong character and based on the nation's Islamic and cultural values (Kejora et al., 2021).

The management of land and facilities in eco-pesantren as a model of ecology-based education with local wisdom is very urgent to support the achievement of the Sustainable Development Goals (SDGs), especially in the context of quality education (SDG 4) and action on climate change (SDG 13). By integrating ecological principles in resource management, eco-pesantren can create a learning environment that supports ecological awareness and sustainable behavior among students (Rachman et al., 2022). However, the challenges faced include limited resources, lack of training for educators in applying ecology-based methods, and resistance to changes from traditional educational approaches (Hafsaridewi et al., 2019).

In addition, Ramadhan et al (2022) criticized land and campus management regarding concerns that a focus on local wisdom could ignore broader global issues related to sustainability. Support from the government and relevant institutions is essential to address these challenges, including the provision of funding, training, and development of relevant curricula (Safitri et al., 2022). Thus, the management of land and facilities in the pesantren not only serves as an educational tool but also as a means to build awareness and collective action in facing environmental challenges, which is in line with the broader goals of the SDGs.

The community at the Al Ashriyyah Nurul Iman Islamic Boarding School supports the achievement of the SDGs through the Nurul Iman Environmental Hygiene (KLNI) program and collaboration with external partners, which integrate environmental disciplines and sustainable practices such as organic waste management, organic agriculture, and renewable energy. The community in ecology-based education with local wisdom in eco-pesantren has a high urgency to support the achievement of the Sustainable Development Goals (SDGs), especially in the context of quality education (SDG 4), SDG 12 (Responsible Consumption and Production), SDG 6 (Clean Water and Proper Sanitation), and partnerships for the goals (SDG 17).

The "learning by doing" approach applied in this program not only strengthens the practical skills of students, but also builds their character and leadership, producing a generation that cares about the environment and is ready to face global sustainability challenges (Kharismawati, 2023). Romlah et al (2024) emphasized that the communal and deep nature of pesantren life allows the strengthening of these values through daily practice and interaction through formalized communities such as KLNI thus creating a culture of sustainability that students bring to their future endeavors.

Furthermore, by emphasizing leadership skills in addition to environmental awareness, communities can empower students to advocate for sustainable practices and amplify their impact on individuals and pesantren (Alhashmi & Moussa-Inaty, 2020). Challenges faced include limited resources, lack of support from outside parties, and the need for better training for students and teachers in sustainable practice. Criticism of community activity is often focused on potential inadequacies in reaching out to the entire community and ensuring the active participation of all members. Nevertheless, the learning-by-doing education model in the community not only improves students' understanding of environmental issues, but also empowers them to be actively involved in sustainable practices that can produce meaningful change in their communities (Anabarja & Mubah, 2021). By participating in practical activities such as organic farming, waste management, and renewable energy projects, students develop essential skills and values that are critical to fostering a sustainable future. This is reinforced by the research of Encabo-Fernández et al (2023) which shows that experiential learning significantly increases knowledge retention and application of sustainability concepts by students, so they are more likely to adopt environmentally friendly behaviors.

The eco-pesantren culture at the Al Ashriyyah Nurul Iman Islamic Boarding School includes sustainable living policies and habits designed within the framework of local wisdom "silih asah, silih asih, silih fosuh" as well as Islamic values. Policies such as smoking bans, fines for hygiene violations, and organic waste management are part of the discipline to build environmental awareness. Habits such as "Clean Friday" activities, garbage recycling, and the use of renewable energy such as biogas reflect human responsibility as the caliph on earth, as taught in Islam. Values such as siddiq (honest), amanah (responsible), and fathonah (smart) are applied through practice-based education to realize students who are disciplined and care for the environment.

In the context of local wisdom, the principle of "silih asah" encourages students to share knowledge with each other, "silih asih" builds a sense of affection and care between pesantren residents, and "silih asuh" fosters a sense of shared responsibility in protecting the environment. This combination of local wisdom and Islamic values aims to create a generation of students who are cagueur (healthy), bageur (good), smart (intelligent), true (correct), and singer (responsive). Ecopesantren programs such as organic agriculture and waste management become a forum for practice to instill these values, producing students who are not only intellectually intelligent but also have a strong character in maintaining environmental sustainability and building a harmonious community.

Al Ashriyyah Nurul Iman Islamic Boarding School educates about the benefits of sustainable transportation and the provision of supporting infrastructure. This program aims to create an environmentally friendly transportation culture, reduce fossil fuel consumption, and create positive environmental awareness among Islamic boarding school members. Thus, although the environmentally friendly transportation program has not been fully realized in the form of the use of emission-free vehicles, the transportation program at the Islamic boarding school can play a role in promoting a sustainable lifestyle and caring for the environment.

The application of eco-pesantren culture at Al Ashriyyah Nurul Iman Islamic Boarding School is relevant to several SDG goals, namely SDG3 (Healthy and Prosperous Life) through smoking bans, hygiene policies, and healthy lifestyle habits; SDG4 (Quality Education) with practice-based education and Islamic values that create a generation of students with character and care for the environment; SDG7 (Clean and Affordable Energy) through the use of renewable energy such as biogas; and environmentally friendly infrastructure; SDG13 (Climate Change Management) with waste recycling, waste management, and fossil fuel consumption reduction; and SDG17 (Partnership to Achieve Goals) through the collaboration of local wisdom "alternate sharpening, alternate compassion, alternate fostering" in building a harmonious and sustainable community. By implementing sustainable living policies and habits based on local wisdom "Silih Asah, Silih Asih, Silih Asuh," the pesantren eco-pesantren not only builds the character of students but also creates a community that cares about the environment (Dangi & Jamal, 2016). Ilmi (2015) highlights the strategic role of organic farming practices and sustainable waste management as an integral part of the culture that allows students to learn first-hand about sustainability and ecological responsibility. However, the challenges faced include a lack of resources and support from outside parties, as well as the need for better training for educators in applying ecology-based methods.

Circular economy-based entrepreneurship at the Al-Ashriyyah Nurul Iman Islamic Boarding School is an ecology-based education model that combines local wisdom to support the Sustainable Development Goals (SDGs). This program includes the management of organic waste into biogas and compost, recycling of non-organic waste into paving blocks, and the involvement of students in the entire production process to marketing through a *learning by doing* approach. The environmentally friendly products produced, such as organic fertilizers and biogas, not only support the sustainability of the pesantren internally, but also provide an additional economic contribution to free education. This system encourages students' environmental awareness while building practical skills relevant to sustainability issues, supporting SDG 4 (Quality Education), SDG 7 (Clean and Affordable Energy), and SDG 12 (Responsible Consumption and Production). This approach also integrates Islamic values and

local wisdom, creating students who are characterful, innovative, and able to be agents of change in the wider community.

The entrepreneurship education program implemented in the pesantren plays an important role in empowering students to become socially responsible entrepreneurs and prioritize sustainability in their business ventures. By implementing the *Humane Entrepreneurship* approach and integrating Islamic values into entrepreneurship education, these schools foster a culture of ethical and sustainable business practices among students (Isyanto et al., 2023).

The development of an integrative entrepreneurship education model based on local wisdom further improves students' entrepreneurial skills while prioritizing concern for the environment and sustainable economic growth (Puspitasari & Priatmoko, 2022). Winarno & Nadia (2021) stated that through initiatives such as the Entrepreneurship Education Model, eco-friendly pesantren equip students with the knowledge and skills needed to create businesses that contribute positively to society and the environment, thereby advancing the SDGs.

The entrepreneurship-based pesantren education model encounters various obstacles, challenges, and criticisms in its efforts to support the Sustainable Development Goals (SDGs). Its main challenges include limited access to technology that hinders students' learning opportunities, the need to balance traditional pedagogical approaches with the demands of modern education, and the need to address global challenges while upholding Islamic values amid industrial and economic globalization. Criticism has also emerged regarding the potential association of pesantren alumni with extremist activities, underscoring the importance of addressing radicalization concerns and ensuring that educational institutions advocate for peace, tolerance, and sustainable development in line with the SDGs (Jumhur & Wasilah, 2023).

The circular economy is a strategic solution for overcoming the weaknesses, challenges, and threats faced by eco-pesantren in supporting the sustainable development goals (SDGs) based on culture and Islamic values. With an approach that emphasizes efficient resource management, pesantren can utilize organic waste to produce biogas and fertilizer, as well as recycle non-organic waste into economically valuable products such as paving blocks. This not only reduces dependence on external resources but also addresses financial challenges in pesantren operations, while supporting the sustainability of free education.

The circular economy is also able to overcome environmental threats such as excess waste by making students the main actors in waste management through practice-based learning (*learning by doing*), which is in line with Islamic values such as amanah (responsible) and fathonah (smart) (Zaki et al., 2022). In addition, by integrating local wisdom in entrepreneurial practices, pesantren are able to maintain their cultural identity while creating new economic opportunities that are relevant to global issues (Garc & Duran-heras, 2023). Through this approach, eco-pesantren can turn challenges into opportunities to support SDG 4 (Quality Education), SDG 7 (Clean and Affordable Energy), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Change Management), creating a model of continuing education that is in harmony with local culture and Islamic values.

4. CONCLUSION

Al Ashriyyah Nurul Iman Ecopesantren reflects a holistic ecological-based education model, combining Islamic values, local wisdom, and sustainability principles to support the achievement of the Sustainable Development Goals (SDGs). Through the integration of environment-based curriculum, inclusive community, environmentally friendly campus management, sustainability culture, and circular economy practices, this pesantren has succeeded in producing a generation of students who are intelligent, independent, and environmentally conscious. The circular economy approach specifically addresses financial and environmental challenges by converting waste into productive resources such as biogas, compost, and paving blocks, as well as instilling practical skills in students through practice-based learning (*learning by doing*). By utilizing local wisdom such as "silih asah, silih asih, silih fosuh," this pesantren maintains its cultural identity while creating innovative solutions to

global challenges. Ecopesantren is not only a relevant model of continuing education in the local context, but also offers an approach that can be adapted to other institutions in an effort to support global sustainable development. Despite challenges, such as limited resources and the need for educator training, this approach shows great potential in creating a generation of strong characters who are able to be agents of change in facing future sustainability challenges.

REFERENCES

- Aisyah, S., Ilmi, M. U., Rosyid, M. A., Wulandari, E., & Akhmad, F. (2022). Kiai Leadership Concept in The Scope of Pesantren Organizational Culture. *Tafkir: Interdisciplinary Journal of Islamic Education*, 3(1), 40–59. <https://doi.org/10.31538/tijie.v3i1.106>
- Alhashmi, M., & Moussa-Inaty, J. (2020). Professional Learning for Islamic Education Teachers in the UAE. *British Journal of Religious Education*, 43(3), 278–287. <https://doi.org/10.1080/01416200.2020.1853046>
- Anabarja, S., & Mubah, A. S. (2021). The Islamic Environmentalism in Eco-Pesantren Initiatives: Integrating the Sustainable Development Values in Islamic Boarding School. *Journal of International Studies on Energy Affairs*, 2(1), 75–90. <https://doi.org/10.51413/jisea.vol2.iss1.2021.75-90>
- Arslan, S. (2012). The Influence of Environment Education on Critical Thinking and Environmental Attitude. *Procedia - Social and Behavioral Sciences*, 55(January), 902–909. <https://doi.org/10.1016/j.sbspro.2012.09.579>
- Aulia, R. N., Sauri, S., Jasin, F. M., Narulita, N., & Wajdi, F. (2020). Internalisasi Nilai Peduli Lingkungan Di Persekolahan: Studi Kasus Ecopesantren SPMAA Lamongan Jawa Timur. *Hayula Indonesian Journal of Multidisciplinary Islamic Studies*, 4(1), 87–98. <https://doi.org/10.21009/004.01.05>
- Bakri, M. (2021). ECO-Pesantren assessment study of Islamic Boarding School in Banda Aceh, Indonesia. *Journal of Islamic Architecture*, 6(3), 143–150. <https://doi.org/10.18860/JIA.V6I3.7967>
- BAPPENAS. (2020). *PEDOMAN TEKNIK PENYUSUNAN RENCANA AKSI TUJUAN PEMBANGUNAN BERKELANJUTAN (TPB)/ SUSTAINABLE DEVELOPMENT GOALS (SDGs)*. Kedeputian Bidang Kemaritiman dan Sumber Daya Alam, Kementerian Perencanaan Pembangunan Nasional/ Badan Perencanaan Pembangunan Nasional.
- Cahyadi, N. (2020). *Tatanen di Bale Atikan*. Disdik.Purwakartakab.Go.Id. <https://disdik.purwakartakab.go.id/tatanen-di-bale-atikan?/tatanen-di-bale-atikan>
- Dangi, T. B., & Jamal, T. (2016). An Integrated Approach to “Sustainable Community-Based Tourism.” *Sustainability*, 8(5), 475. <https://doi.org/10.3390/su8050475>
- Dwi, A. (2023). Eko Pesantren: Environmental Concerned Santri Creation Initiatives in The Face Of Envirounmental Threats. *ICONIC FTIK Pekalongan*, 20(01), 14–25.
- Encabo-Fernández, E., Maestre-Espinosa, M., Jerez-Martínez, I., & Hernández-Delgado, L. (2023). Sustainable Teacher Training and SDGs Knowledge: A Study From the Reading Perspective. *Education Sciences*, 13(7), 663. <https://doi.org/10.3390/educsci13070663>
- Finger, D. C., Draghici, C., Perniu, D., Smederevac-Lalić, M., Hălbac-Cotoară-Zamfir, R., Sehic, A., & Solomun, M. K. (2021). The Importance of International Collaboration to Enhance Education for Environmental Citizenship. *Sustainability*, 13(18), 10326. <https://doi.org/10.3390/su131810326>
- Garc, R., & Duran-heras, A. (2023). Influence of Leadership Styles on Sustainable Development for Social Reconstruction: Current Outcomes and Advisable Reorientation for Two Aerospace Multinationals — Airbus and TASL. *Sustainability*, 15.
- Hafsaridewi, R., Khairuddin, B., Ninef, J. S. R., Rahadiati, A., & Adimu, H. E. (2019). Pendekatan Sistem Sosial – Ekologi Dalam Pengelolaan Wilayah Pesisir Secara Terpadu. *Buletin Ilmiah Marina Sosial Ekonomi Kelautan Dan Perikanan*, 4(2). <https://doi.org/10.15578/marina.v4i2.7389>
- Handayati, P., Wulandari, D., Soetjipto, B. E., Wibowo, A., & Narmaditya, B. S. (2020). Does entrepreneurship education promote vocational students’ entrepreneurial mindset? *Heliyon*, 6(11), e05426. <https://doi.org/10.1016/j.heliyon.2020.e05426>

- Helfaya, A., & Aboud, A. (2023). Editorial for the Special Issue "Corporate Governance, Social Responsibility, Innovation, and Sustainable Business Development Goals." *Sustainability (Switzerland)*, 15(12). <https://doi.org/10.3390/su15129471>
- Herdiansyah, H., Jokopitoyo, T., & Munir, A. (2016). Environmental Awareness to Realizing Green Islamic Boarding School (Eco-Pesantren) in Indonesia. *Iop Conference Series Earth and Environmental Science*, 30, 12017. <https://doi.org/10.1088/1755-1315/30/1/012017>
- Herdiansyah, H., Sukmana, H., & Lestarini, R. (2019). Eco-Pesantren as A Basic Forming of Environmental Moral and Theology. *Kalam*, 12(2), 303–326. <https://doi.org/10.24042/klm.v12i2.2834>
- Ilmi, D. (2015). Pendidikan Karakter Berbasis Nilai-Nilai Kearifan Lokal Melalui Ungkapan Bijak Minangkabau. *Islam Realitas Journal of Islamic & Social Studies*, 1(1), 45. https://doi.org/10.30983/islam_realitas.v1i1.7
- Isyanto, A. Y., Fatimah, A. T., Thoyyibah, L., & Millah, A. S. (2023). Interdisciplinary perspectives on conservation and culture. *Interdisciplinary Perspectives on Conservation and Culture*, 1(1), 15–30.
- Jones, Paula, Selby, D., & Sterling, S. (2020). Sustainability Education: Perspectives and Practice across Higher Education. In *The Palgrave Handbook of Global Sustainability* (Vols. 2–3). Taylor & Francis. https://doi.org/10.1007/978-3-031-01949-4_173
- Jones, Peter, Wynn, M., Hillier, D., & Comfort, D. (2017). The Sustainable Development Goals and Information and Communication Technologies. *Indonesian Journal of Sustainability Accounting and Management*, 1(1), 1. <https://doi.org/10.28992/ijSAM.v1i1.22>
- Jumhur, & Wasilah. (2023). Constitute-Based Religious Moderation Education: Studies on the Qadariyah wa Naqshabandiyah Thariqah in Islamic Boarding School. *Al-Hayat: Journal of Islamic Education (AJIE)*, 7(2).
- Kejora, M. T. B., Sittika, A. J., & Syahid, A. (2021). Penguatan Pendidikan Karakter Berbasis Humanistik Melalui Kearifan Lokal Dan Nilai Pendidikan Islam Pada Anak Panti Asuhan. *Dharma Raflesia Jurnal Ilmiah Pengembangan Dan Penerapan Ipteks*, 19(1), 111–123. <https://doi.org/10.33369/dr.v19i1.14020>
- Khairani, N., & Fauzi, A. (2023). Program Eco-Pesantren: Peran dan Solusi dalam Pembangunan Berkelanjutan Terhadap Krisis Lingkungan. *Jurnal Inovasi Penelitian*, 4(2), 211–218.
- Kharismawati, S. A. (2023). Implementasi Pembelajaran IPS Berbasis Kearifan Lokal "Manurih Gatah" Melalui Teori Belajar Humanistik Bagi Siswa Sekolah Dasar. *Ideguru Jurnal Karya Ilmiah Guru*, 8(3), 782–789. <https://doi.org/10.51169/ideguru.v8i3.706>
- Khoirunnisak, K., Abdullah, A., Mudarris, B., & Maiyeenah Pochiseng, N. (2023). *The Learning Behaviour Based on Islamic Value; Strategy Improvement for Pesantren Sustainability*. 2(1), 41–52. <https://doi.org/10.61987/jemr.v2i1.249>
- Kudus, A., & Riau, U. I. (2021). Sustainable and Environmentally Friendly Transportation : What We Can Learn For Indonesia. *CSID Journal of Infrastructure Development*, 2(February). <https://doi.org/10.32783/csid-jid.v2i2.72>
- Lathifah, Z. K., Setyaningsih, S., & Wulandari, D. (2022). Development of Internal Quality Assurance System Model for Pesantren Using the 2020 Education Unit Accreditation Instrument. *AL-TANZIM: Jurnal Manajemen Pendidikan Islam*, 6(4), 983–998. <https://doi.org/10.33650/al-tanzim.v6i4.2246>
- Li, L., Li, G., Öztürk, İ., & Ullah, S. (2022). Green Innovation and Environmental Sustainability: Do Clean Energy Investment and Education Matter? *Energy & Environment*, 34(7), 2705–2720. <https://doi.org/10.1177/0958305x221115096>
- Lynch, A. J., Elliott, V., Phang, S. C., Claussen, J. E., Harrison, I., Murchie, K. J., Steel, E. A., & Stokes, G. L. (2020). Inland fish and fisheries integral to achieving the Sustainable Development Goals. *Nature Sustainability*, 3(8), 579–587. <https://doi.org/10.1038/s41893-020-0517-6>
- Maduningtias, L. (2022). Manajemen Integrasi Kurikulum Pesantren Dan Nasional Untuk Meningkatkan Mutu Lulusan Pesantren. *Al-Afkar Journal for Islamic Studies*, 323–331.

- <https://doi.org/10.31943/afkarjournal.v5i4.378>
- Mangunjaya, Fachrudin M. (2014). *Ekopesantren: Bagaimana Merancang Pesantren Ramah Lingkungan?* Yayasan Pustaka Obor Indonesia.
- Mangunjaya, Fachrudin M, & Wahyono, E. H. (2022). *Panduan Ekopesantren Menuju Pesantren Berwawasan Lingkungan* (1th ed.). LP3ES.
- Marta-Lazo, C., Acedo, S. O., & Quintana, J. G. (2019). sMOOC: A Pedagogical Model for Social Inclusion. *Heliyon*, 5(3), e01326. <https://doi.org/10.1016/j.heliyon.2019.e01326>
- Nurdin, D., & Rasyid, S. (2022). Islamic Boarding School Education Model (IB-SEM) to Create Leadership Integrity: Using NVivo 12 Analysis. *Al-Ishlah Jurnal Pendidikan*, 14(4), 6243–6254. <https://doi.org/10.35445/alishlah.v14i4.1936>
- Pal, S. (2023). Sustainable Higher Education Systems - Approaches & Practices With Emphasis on Green Technologies and Their Integration in Higher Education Systems. *International Journal for Multidisciplinary Research*, 5(3). <https://doi.org/10.36948/ijfmr.2023.v05i03.2968>
- Pujianto, W. E., Larassaty, A. L., Novie, M., Muzdalifah, L., & Rosyidah, E. (2021). Eco-Pesantren: Program Transformasi Pondok Pesantren untuk Mendukung Kelestarian Alam dan Pembangunan Berkelanjutan. *Prosiding Konferensi Internasional Tentang Teknik Industri & Mesin Dan Manajemen Operasi*, 873–885. <https://ieomsociety.org/proceedings/2021dhaka/487.pdf>
- Puspitasari, F. F., & Priatmoko, S. (2022). Development of Integrated Entrepreneurship Education Based on Local Wisdom Through Jagong Maton. *Nidhomul Haq: Jurnal Manajemen Pendidikan Islam*, 6(3), 690–703.
- Rachman, E. A., Sari, D. Y., Humaeroh, D., Wahidin, D., & Hanafiah, H. (2022). Model Pembelajaran Pancaniti Dalam Pendidikan Karakter. *Jurnal Educatio Fkip Unma*, 8(4), 1533–1546. <https://doi.org/10.31949/educatio.v8i4.3987>
- Ramadhan, G. M., Al Hadiq, M. F., & Chaerunnisa, S. (2022). Analisis Kecerdasan Ekologis Siswa Dalam Program Adiwiyata Sekolah Dasar Negeri Manunggal Bhakti. *Collase (Creative of Learning Students Elementary Education)*, 5(3), 624–633. <https://doi.org/10.22460/collase.v5i3.10936>
- Rohman, A. (2017). Pesantren as a Basis for Internalization of Pluralistic Values for Preparing a Democratic Citizens in a Diverse Society. *Walisono Jurnal Penelitian Sosial Keagamaan*, 25(2), 419. <https://doi.org/10.21580/ws.25.2.1324>
- Romlah, L. S., Purnama, R., Ambarwati, R., Hijriyah, U., Amriyah, C., & Jamaluddin Z, W. (2024). Environmental-Based Learning Management in Islamic Education Institutions. *E3s Web of Conferences*, 482, 4019. <https://doi.org/10.1051/e3sconf/202448204019>
- Rouf, A., Syukur, F., & Maarif, S. (2024). Entrepreneurship in Islamic Education Institutions: Pesantren Strategy in Responding to the Industrial Revolution 4.0. *Tafkir Interdisciplinary Journal of Islamic Education*, 5(2), 250–265. <https://doi.org/10.31538/tijie.v5i2.1115>
- Safitri, A. O., Yuniarti, V. D., & Rostika, D. (2022). Upaya Peningkatan Pendidikan Berkualitas Di Indonesia: Analisis Pencapaian Sustainable Development Goals (SDGs). *Jurnal Basicedu*, 6(4), 7096–7106. <https://doi.org/10.31004/basicedu.v6i4.3296>
- Scharmer, O. (2018). *The Essentials of Theory U: Core Principles and Applications*. In *Berrett-Koehler Publishers, Inc.* https://books.google.co.za/books/about/The_Essentials_of_Theory_U.html?id=C504DwAAQBAJ&printsec=frontcover&source=kp_read_button&redir_esc=y#v=onepage&q&f=false
- Sitika, A. J., Kejora, M. T. B., & Syahid, A. (2021). Strengthening humanistic based character education through local values and Islamic education values in basic education units in purwakarta regency. *İlköğretim Online*, 20(2), 22–32. <https://doi.org/10.17051/ilkonline.2021.02.06>
- Sittika, A. J., Taufik, M., & Kejora, B. (2022). *Utilization of Google Classroom in Islamic Religious Education in Higher Education during the Covid 19 Pandemic*. 11(1), 62–70.
- Sulaeman, A., Makhruh, M., & Makhful, M. (2021). Filantropi Islam Dalam Upaya Pembentukan Karakter Dengan Sistem Pendidikan Terpadu. *Alhamra Jurnal Studi Islam*, 2(2), 123. <https://doi.org/10.30595/ajsi.v2i2.11701>

- Suryanto, B. T. (2019). Eko-Pesantren: Mewujudkan Pesantren Peduli Dan Berbudaya Lingkungan Berbasis Kemandirian. *Jurnal ISLAM NUSANTARA*, 03(01), 263–286.
- Syafei, I. (2017). PONDOK PESANTREN: Lembaga Pendidikan Pembentukan Karakter. *Al-Tadzkiyyah Jurnal Pendidikan Islam*, 8(1), 61. <https://doi.org/10.24042/atjpi.v8i1.2097>
- Taufik, Muhamad. (2020). Strategic Role of Islamic Religious Education in Strengthening Character Education in the Era of Industrial Revolution 4.0. *Jurnal Ilmiah Islam Futura*, 20(1), 86. <https://doi.org/10.22373/jiif.v20i1.5797>
- Taufik, Muhammad. (2020). *Strategi Role Of Islamic Religious Education In Strengtheing Characther Education In The Era Of Industrial Revolution 4.0*. 20.
- Wahyudin, U. R., & Bk, M. T. (2022). *Sustainable Professional Development : Skills and Needs for Scientific Publication Training for Elementary School Teachers*. 11(1), 142–153.
- Wasehudin, W., Rohman, A., Nizarudin Wajdi, M. B., & Marwan, M. (2023). Transforming Islamic Education Through Merdeka Curriculum in Pesantren. *Jurnal Pendidikan Islam*, 9(2), 255–266. <https://doi.org/10.15575/jpi.v9i2.28918>
- Winarno, A., & Nadia, D. R. (2021). Double-Track Entrepreneurial Education Model to Improve Independence Among Students of Islamic Boarding School in Malang. *Jurnal Ilmu Pendidikan (JIP)*, 27(2), 81–86.
- Zaki, I., Zusak, M. B. F., Mi'raj, D. A., & Hasib, F. F. (2022). Islamic Community-Based Business Cooperation and Sustainable Development Goals: A Case of <i>pesantren</i> Community in Indonesia. *International Journal of Ethics and Systems*, 38(4), 621–632. <https://doi.org/10.1108/ijoes-12-2021-0218>