

Islamic Boarding Schools and Green Education: Islamic Ecology-Based Education Models for Future Generations

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ABSTRACT

Pesantren is an Islamic educational institution that has strategic potential in integrating spiritual values with ecological awareness. This study aims to formulate a model of Islamic ecology education in Islamic boarding schools by examining the supporting factors, obstacles, and strategies for strengthening *the eco-pesantren* program in Kuningan Regency. The research method used was qualitative descriptive with a case study approach on five purposively selected pesantrens. Data were collected through in-depth interviews, participatory observations, and documentation, then analyzed with thematic analysis techniques using the help of NVivo 12 software. The results of the study show that there are four main dimensions that form the conceptual framework of Islamic ecology education in Islamic boarding schools, namely the integration of Islamic values and spirituality, the development of a green curriculum, experiential pedagogy, and external leadership and partnerships. These four dimensions complement each other in building the ecological awareness of students. However, the study also found a number of obstacles, such as limited funding, lack of formal curriculum, low teacher capacity, and environmental programs that are still sporadic. Therefore, institutional strengthening strategies, the formulation of a more structured green curriculum, and policy support from the government and external partners are needed. This research provides a theoretical contribution in the form of enrichment of literature on the integration of Islamic education and the environment, as well as a practical contribution for pesantren managers in building a generation of ecologically insightful students. Thus, *eco-pesantren* can be a relevant model of continuing education to face global ecological challenges in the future.

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1. Introduction

The current global environmental crisis has reached an alarming point. The *Intergovernmental Panel on Climate Change* (IPCC, 2022) report confirms that global warming with an average temperature increase of 1.1°C has caused real impacts in the form of extreme climate change, major floods, long droughts, and biodiversity damage. This condition is exacerbated by industrialization, uncontrolled urbanization, and excessive human consumption patterns of natural resources. These changes have far-reaching implications, not only for the sustainability of ecosystems, but also for human socio-economic life, such as reduced food productivity, increased poverty, and social conflicts due to resource struggles (UNESCO, 2021). Therefore, environmental issues have become a global agenda that requires serious attention, including through education as an instrument of changing human behavior.

From an Islamic perspective, the environmental crisis cannot be separated from spiritual values and religious ethics. The Qur'an has warned that humans are caliphs on earth who are in charge of maintaining the balance of nature (QS. Al-Baqarah [2]: 30). Allah also affirms, "*There has been a seed of destruction on land and in the sea caused by the deeds of human hands*" (QS. Ar-Rum [30]: 41), which is a real reflection of the current ecological conditions. The hadith of the Prophet Muhammad PBUH provides a practical basis, such as his saying: "*If the apocalypse occurs while there is a seed of dates in the hands of one of you, then he should plant it*" (HR. Ahmad). This teaching shows that protecting nature is a spiritual obligation, not just a social activity. Contemporary Islamic literature emphasizes the need for Islamic ecotheology as a new paradigm in dealing with modern ecological crises (Nasr, 2021).

In the national context, Indonesia faces serious challenges in terms of environmental degradation. Data from the Ministry of Environment and Forestry (MoEF, 2023) noted that the rate of deforestation still reached 104 thousand hectares per year, while the production of plastic waste reached 12.5 million tons per year. On the other hand, the ecological literacy index of the Indonesian people is still relatively low, so awareness of environmental sustainability has not been widely internalized in daily life practices (Hasanah & Suryana, 2022). Environmental education has been pursued through the national curriculum, but it is still partial and not fully effective in forming ecological awareness. Therefore, the integration of environmental education into faith-based educational institutions is important, considering its strategic role in shaping community behavior and morals.

At the local level, pesantren as traditional Islamic educational institutions have great potential in internalizing sustainability values. Kuningan Regency, West Java, as one of the areas with a strong Islamic boarding school base, is a relevant location for this study. The Ministry of Religious Affairs (2023) noted that there are more than 60 Islamic boarding schools in Kuningan Regency with diverse characteristics, ranging from salafiyah Islamic boarding schools to modern Islamic boarding schools. A number of Islamic boarding schools in this area have initiated environmentally friendly programs such as waste management, organic agriculture, and greening of pesantren areas. However, most of these programs are still sporadic, have not been integrated into the curriculum, and lack adequate institutional support. This raises questions about how pesantren in Kuningan can transform into *a sustainable eco-pesantren model*.

Departing from these conditions, this study highlights the main problem: how pesantren can formulate a comprehensive, integrated, and environmentally friendly education model based on Islamic ecology that is able to respond to environmental challenges in the next five years. This problem is important because environmental

education in Islamic boarding schools still does not have a systematic framework that can be used as a guideline in practice. By formulating a clear model, pesantren can play a strategic role not only as a religious educational institution, but also as an environmentally sound educational center that makes a real contribution to sustainable development.

This research aims to formulate a pesantren-based Islamic Ecology Education Model that is sourced from Islamic values, empirical practices of pesantren, and external partnership support. In particular, this study aims to identify the main dimensions that affect the success of *the eco-pesantren* program, analyze the obstacles faced, and formulate practical recommendations for pesantren managers and policy makers. With a focus on five Islamic boarding schools in Kuningan Regency, this research is expected to make a local contribution that can be generalized to the national context.

The urgency of this research lies in the increasing need for Islamic education that is able to respond to global issues. In the next five years, environmental challenges in Indonesia are expected to become more severe due to urbanization, industrialization, and climate change (IPCC, 2022). Islamic boarding schools, which have been known as centers of moral education, have a great opportunity to appear as pioneers in environmentally friendly education. If this potential is managed systematically, pesantren can become a significant agent of ecological transformation, while supporting the achievement of *the Sustainable Development Goals* (SDGs), especially SDG 4 (quality education) and SDG 13 (handling climate change).

Previous studies provide an important insight. Anwar (2021) emphasized the importance of integrating an ecology-based curriculum in public schools, although its effectiveness is limited without institutional support. Nugroho (2022) highlights the role of local communities in environmental education, but lacks the discussion of the integration of religious values. Fitriah (2023) found that religion-based ecological literacy has great potential in building ecological awareness, but it has not been formally applied in Islamic educational institutions. Hasanah & Suryana (2022) assert that the integration of Islamic values in environmental education increases the effectiveness of value internalization, but their research is limited to the context of Islamic schools, not Islamic boarding schools. Thus, research that specifically examines Islamic boarding schools is still rare.

Table 1. Summary of Previous Research and Research Gaps

Researcher & Year	Research Focus	Key Findings	Limitations/Gaps
Anwar (2021)	Ecology-based curriculum in public schools	The curriculum increases students' ecological awareness	Not religiously based; lack of institutional support
Nugroho (2022)	The role of local communities in environmental education	Effective communities in ecological literacy	Not studying Islamic educational institutions
Fitriah (2023)	Religion-based ecological literacy	Religion strengthens the ecological ethics of the younger generation	Not yet integrated in the formal education of the pesantren
Hasanah & Suryana (2022)	Environmental education in Islamic schools	Islamic values increase the effectiveness of environmental learning	Focus only on schools, not pesantren
This research	Islamic ecological	Formulating an	Closing the gap of

education model based on pesantren in Kuningan Regency	integrative conceptual model: values, curriculum, pedagogy, leadership & partnership	previous research; Focus on Islamic Boarding Schools with Field Case Studies
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From the table above, it is clear that previous research still leaves a number of gaps. First, the majority of research only emphasizes the context of public schools or local communities, so it has not touched on pesantren as Islamic educational institutions with unique characteristics. Second, the approach used tends to be normative and descriptive, without producing an operational framework that can be used as a guideline for Islamic educational institutions. Third, existing research highlights aspects of ecological literacy, while curriculum integration, experiential pedagogy, and leadership and partnerships have not been comprehensively studied.

This research offers *novelty* by developing an Islamic Ecology Education Model based on pesantren through case studies in five Islamic boarding schools in Kuningan Regency. The model not only captures field practice, but also formulates an integrative conceptual framework, covering four main dimensions: values and spirituality, green curriculum, experiential pedagogy, and external leadership and partnerships. Thus, this research not only provides an academic contribution in the form of the development of Islamic and environmental education literature, but also a practical contribution for pesantren managers, the government, and policy makers in developing *systematic and sustainable* eco-pesantren programs.

2. Methodology

This study uses a qualitative-descriptive approach with a multiple case study *design*. This design was chosen because it was able to explore the phenomenon of Islamic ecological education in a social, cultural, and spiritual context typical of Islamic boarding schools. The qualitative approach allows researchers to understand the meaning, values, and experiences of the participants in depth, so that they can formulate a conceptual model that is in accordance with the reality of the field.

The research was carried out on five Islamic boarding schools in Kuningan Regency, West Java, which were selected based on the diversity of characteristics (salafiyah and modern Islamic boarding schools), the size of the institution, and the level of adoption of environmentally friendly programs. The selection of the location was carried out through purposive sampling, with the following criteria: (1) the pesantren has an environmentally-related program or activity (although simple), (2) the pesantren is willing to be the research location, and (3) the pesantren represents a variation in the level of *eco-pesantren* integration. Data collection was carried out during the January-May 2024 period.

The informants consist of 15 people, with the composition of each Islamic boarding school: one kiai/caregiver, one ustadz/educator, and one representative student. The purposive sampling technique is used to select informants who are considered to have experience and direct involvement in environmentally friendly activities. The selection of the number of informants is considered adequate to produce *information-rich cases* and allow comparisons across cases.

Three main techniques are used in data collection:

1. The semi-structured interview with guidelines contains 15 main questions regarding the integration of Islamic values, the green curriculum, student practices, the role of kiai leadership, and forms of external partnerships. Interviews were conducted face-to-face at the pesantren, with a duration of 45-60 minutes per informant.
2. Participatory observation of the daily activities of the students, such as environmental cleanliness activities, organic farming practices, waste management, and greening of the pesantren area. Observation was carried out by recording the behavior patterns, involvement, and dynamics of interaction between students and teachers.
3. Documentation studies of pesantren archives (environmental programs, curriculum, activity reports), as well as visual documentation in the form of photos of environmentally friendly activities at pesantren.

This research was carried out by paying attention to the ethical principles of research. All informants provide informed consent orally and in writing before the interview. The identity of the informant is kept confidential by using an anonymous code, for example "Informant 1 (Kiai Pesantren A)". This research is carried out while respecting the values, traditions, and norms of the pesantren, and ensuring that the data collected is only used for academic purposes.

The data was analyzed using thematic analysis (Braun & Clarke, 2006) which consisted of six stages: (1) data familiarization through interview transcription, (2) initial *coding*, (3) search for potential themes, (4) theme review, (5) theme definition and naming, and (6) preparation of analysis reports. The analysis process is done manually with the help of NVivo 12 software to make it easier to organize data.

To ensure the *trustworthiness* of the data, this study uses several strategies:

1. Source triangulation: data is collected from various informants (kiai, ustadz, students) to avoid a single bias.
2. Triangulation method: data collection through interviews, observations, and documentation so that findings can be mutually reinforcing.
3. Member checking: interim results are discussed again with the informant to ensure the appropriateness of interpretation.
4. Peer debriefing: discussions are conducted with Islamic and environmental education experts to validate the resulting categories and themes.

With this methodology design, the research is expected to be able to produce credible, in-depth, and relevant findings to formulate Islamic Ecology Education Models based on pesantren that can be replicated in various Islamic educational institutions.

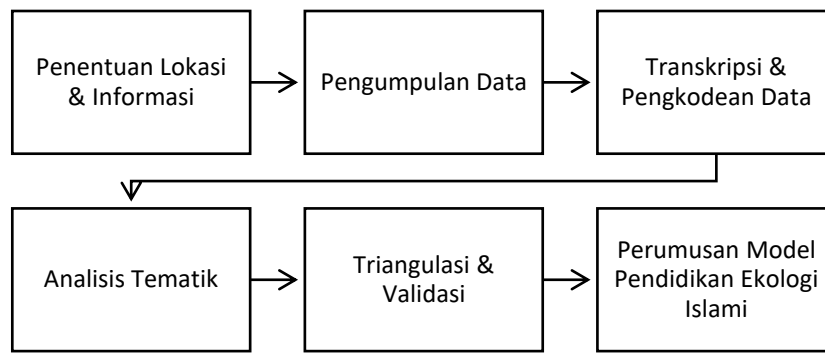


Figure 1. Research Flow

3. Results and Discussion

The results of the interviews show that all Islamic boarding schools place Islamic teachings as a basis in building environmental awareness. Kiai Pesantren A said:

"We always emphasize to students that destroying nature means going against Allah's mandate. This nature does not belong to us, but a trust that must be safeguarded." (Informant 1, Kiai Pesantren A).

This value is strengthened by thematic recitation using the interpretation of Qur'anic verses about the environment, such as QS. Ar-Rum [30]: 41 and QS. Al-A'raf [7]: 56. With this approach, students understand that protecting the environment is not only a social responsibility, but also a religious obligation.

This phenomenon is in line with Fitriah's (2023) research which confirms that religious literacy improves the ecological ethics of the younger generation. However, this research extends it to the context of pesantren with spiritual practices, such as special prayers before planting trees or reading the Prophet's hadith about the prohibition of wasting water while in the river.

The integration of the green curriculum in Islamic boarding schools is still limited. Of the five Islamic boarding schools studied, only Islamic Boarding School C began to formulate written modules on *fiqh al-bi'ah* (environmental fiqh). Ustadz Pesantren C explained:

"We are trying to make a small module on environmental fiqh. Students learn how Islam regulates human relations with nature." (Informant 6, Ustadz Pesantren C).

Other Islamic boarding schools still rely on informal integration in fiqh subjects, interpretation, and daily practices. This shows that there is a great opportunity to develop a systematic green curriculum.

Table 2. The Level of Green Curriculum Integration in Islamic Boarding Schools

Boarding	Integration of Islamic Values	Environmental Practical Activities	Formal Curriculum Documents
A	Very powerful	Organic farming, waste bank	Not yet
B	Quite powerful	Greening	Not yet
C	Strong	Integrated waste management	There is (partially)
D	Weak	At least	None
E	Strong	Clean water program, greening	Not yet

This table shows the variation in the level of integration. Most Islamic boarding schools already have practical activities, but they are not supported by a formal curriculum. This is in line with Hasanah & Suryana (2022) who emphasized the need for official documents for the program to be sustainable.

Direct experience is the main method in environmental education in Islamic boarding schools. Observations show that students are involved in daily activities such as cleaning the environment, processing compost, planting vegetables, and caring for trees.

A student from Pesantren B revealed:

"Every day we have a picket schedule to clean the yard and manage garbage. If anyone violates, the ustadz advises that it is part of worship." (Informant 10, Islamic Boarding School Student B).

This practice is in line with Kolb's (2015) *theory of experiential learning*, which emphasizes that concrete experiences reinforce the internalization of values. By actively involving students, environmental education is not only understood cognitively, but also lived emotionally and spiritually.

Kiai's leadership has proven to be the main driving force. Islamic boarding schools led by visionary kiai show greater achievements. Kiai Pesantren C stated:

"If the kiai gives an example, the students and ustadz will automatically follow. That's why I planted my own tree with the students so that they would be motivated." (Informant 3, Kiai Pesantren C).

In addition, partnerships with outsiders prove to be important. Pesantren C collaborates with the Environment Agency for the waste bank program, while Pesantren E partners with environmental NGOs to develop clean water treatment technology.

Despite the great potential, the study found several obstacles:

1. Limited funds for program development.
2. The lack of a supportive written curriculum.
3. Low capacity of teachers in integrating environmental issues.
4. The program is still sporadic and unstructured.

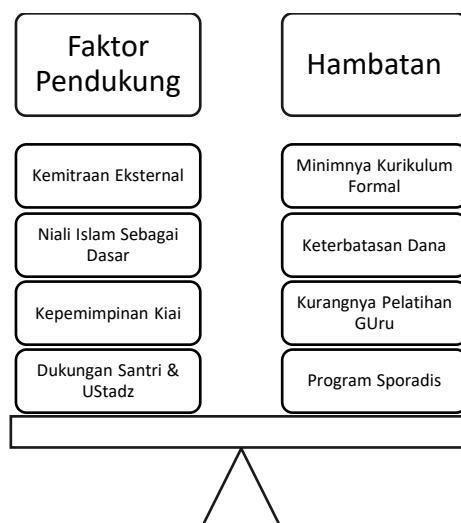


Figure 2. Supporting Factors and Obstacles to Eco-Pesantren

The findings of this study show that pesantren are able to present a unique approach in environmental education. If in Anwar's (2021) research, environmental education is more focused on the integration of formal curriculum in public schools, pesantren emphasize on strengthening spiritual values and daily practices. Likewise, Nugroho (2022) highlights the role of local communities as drivers of environmental education, but pesantren prove themselves as *community-based institutions* that not only educate students, but also have an impact on the surrounding community. This is in line with Hassan's (2020) research in Malaysia which emphasizes that Islamic educational institutions can be a motor for ecological change based on religious values.

In addition, pesantren show potential in developing contextual environmental education. In the theory of *place-based education* (Gruenewald, 2003), place-based education emphasizes the importance of connectivity with the local environment. Pesantren in Kuningan has practiced this by involving students in the management of local resources, such as clean water, organic agriculture, and waste management. These findings expand the literature by providing empirical evidence of how *place-based education* can be integrated with Islamic spiritual values.

From the analysis of the findings, it can be formulated that the four main dimensions – the integration of Islamic values, the green curriculum, the experiential pedagogy, and leadership and partnerships – do not stand alone, but complement each other. The integration of Islamic values becomes a normative foundation, the green curriculum becomes a systematic instrument, experiential pedagogy becomes a method of internalization, while leadership and partnership become a strengthening factor and guarantor of sustainability.

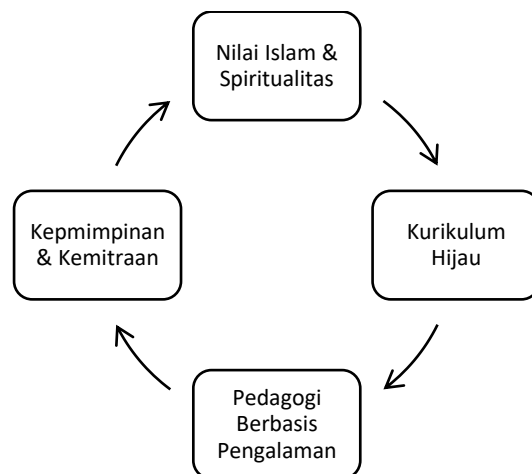


Figure 3. Islamic Ecology Education Model of Islamic Boarding Schools

The formulation of this model is in accordance with the *framework of ecopedagogy* put forward by Gadotti (2008), which emphasizes that environmental education must be holistic, critical, and transformative. However, this research makes a new contribution by including dimensions of Islamic religiosity and charismatic leadership of the kiai, which are rarely touched upon in the global literature. Thus, the Islamic ecological education model based on pesantren can be seen as an enrichment of the theory of *ecopedagogy* in the local context of Indonesia.

While the great potential is obvious, the study also found a number of weaknesses that need to be criticized. For example, the green curriculum is still sporadic and not well documented. This risks making the program lose continuity in the event of a change in leadership or a change in internal policy. In addition, the lack of financial support limits the space for Islamic boarding school innovation, so environmental programs often rely on external assistance.

This condition shows that pesantren need more serious policy intervention from the government and large Islamic organizations. As stated by Tilbury (2011), education for *sustainable development* requires policy support, national curriculum, and teacher capacity building so that it can be widely implemented. If pesantren only rely on internal initiatives without external support, then their great potential will not develop optimally.

The academic contribution of this research is to expand the horizon of literature on environmental education by adding an Islamic perspective based on Islamic boarding schools. Previously, the literature on Islamic ecotheology (Nasr, 2021) was more normative and philosophical. This research provides an empirical dimension with real case studies in five Islamic boarding schools. Meanwhile, the practical contribution is to present a conceptual model that can be used by pesantren managers, local governments, and the Ministry of Religion as a reference for the development of *eco-pesantren*.

This contribution is increasingly relevant because environmental education in Indonesia still tends to be centered on formal schools. Islamic boarding schools, with more than 36 thousand in number throughout Indonesia (Ministry of Religion, 2023), have tremendous potential to become pioneers in faith-based environmental education. If each pesantren is able to adopt some of this model, the impact will be significant in increasing the ecological awareness of the wider community.

This research has a strategic position in filling the research gap. So far, studies on environmental education in Indonesia have mostly focused on public schools, formal Islamic schools, or local communities. Islamic boarding schools as traditional Islamic educational institutions have received less attention. By examining five Islamic boarding schools in Kuningan, this research not only closes *the research gap*, but also presents a new model that can be replicated in other areas.

The novelty of this research lies in its integrative approach that combines four main dimensions at once. This is different from the research of Hasanah & Suryana (2022) which only emphasizes the integration of Islamic values, or Nugroho (2022) which highlights the role of community. This research shows that the success of *eco-pesantren* requires a combination of values, curriculum, methods, leadership, and partnerships. Thus, this research enriches the literature and emphasizes the position of pesantren as an important actor in Islamic environmental education.

4. Conclusion

This research confirms that pesantren has strategic potential as a center for Islamic ecology education through four main dimensions: integration of Islamic values and spirituality, green curriculum development, experiential pedagogy, and kiai leadership and external partnerships. These four dimensions strengthen each other in

building an *eco-pesantren* conceptual framework that is able to form a generation of ecologically minded students. However, implementation is still constrained by the lack of a formal curriculum, limited funds, low teacher capacity, and inconsistent nature of the program, so a more targeted institutional strengthening strategy is needed.

Practically, pesantren managers need to develop a structured green curriculum, strengthen the capacity of educators through training, and establish partnerships with the government, universities, and community institutions to make *eco-pesantren programs* more sustainable. Policy support and funding from the Ministry of Religion and local governments are also needed to strengthen Islamic boarding school institutions in the environmental field. Meanwhile, theoretically, this research opens up space for the development of a more integrative, Islamic-based environmental education concept, by combining spiritual approaches, experiential pedagogy, and transformational leadership. This implication is important to enrich the Islamic education literature while providing an alternative model in the global discourse on *education for sustainable development (ESD)*.

References

- Ahmad ibn Hanbal. (1998). *Musnad Ahmad ibn Hanbal* (Vol. 5). Beirut: Dar al-Fikr.
- Ahmad, I. (n.d.). *Musnad Ahmad bin Hanbal*. Beirut: Dar al-Kutub al-'Ilmiyyah.
- Al-Qur'an. (2005). *Al-Qur'an dan Terjemahannya*. Jakarta: Departemen Agama Republik Indonesia.
- Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), 589–597. <https://doi.org/10.1080/2159676X.2019.1628806>
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Thousand Oaks, CA: Sage.
- Fitriah, N. (2023). Religious literacy and ecological awareness in Muslim youth. *Environmental Education Journal*, 12(1), 55–72. <https://doi.org/10.1080/xyz123456>
- Gadotti, M. (2008). Education for sustainability: A critical contribution to the Decade of Education for Sustainable Development. *Green Theory & Praxis: The Journal of Ecopedagogy*, 4(1), 15–24. <https://doi.org/10.3903/gtp.2008.4.1.15>
- Gruenewald, D. A. (2003). The best of both worlds: A critical pedagogy of place. *Educational Researcher*, 32(4), 3–12. <https://doi.org/10.3102/0013189X032004003>
- Hasanah, L., & Suryana, T. (2022). Religious values and environmental education in Indonesia. *Indonesian Journal of Islamic Education*, 4(3), 201–218. <https://doi.org/10.18326/ijie.v4i3.201-218>
- Intergovernmental Panel on Climate Change (IPCC). (2022). *Climate change 2022: Mitigation of climate change*. Geneva: IPCC.
- Kementerian Lingkungan Hidup dan Kehutanan (KLHK). (2023). *Laporan tahunan lingkungan hidup Indonesia*. Jakarta: KLHK.
- Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning and development* (2nd ed.). Upper Saddle River, NJ: Pearson Education.
- Nasr, S. H. (2021). *Man and nature: The spiritual crisis of modern man*. Kuala Lumpur: Islamic Book Trust.
- Nugroho, A. (2022). Community participation in environmental education. *Journal of Sustainable Development*, 15(4), 98–113. <https://doi.org/10.5539/jsd.v15n4p98>
- Patton, M. Q. (2015). *Qualitative research & evaluation methods* (4th ed.). Thousand Oaks, CA: Sage.
- UNESCO. (2021). *Reimagining our futures together: A new social contract for education*. Paris: UNESCO Publishing.