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Improving Environmental Knowledge and Awareness Through Conservation Education Containing Religious Values in Prospective Biology Teacher

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Abstract: The purpose of this study is to describe efforts to improve environmental knowledge and awareness in prospective biology teacher students through a conservation education program containing religious values. This study uses a qualitative approach with a quasi-experimental method. Research data were collected through tests (quantitative data), questionnaires (qualitative). Qualitative data was analyzed using descriptive analytical techniques, while quantitative data was analyzed using inferential statistical techniques, specifically t-tests and N-gain analysis. Research interventions were carried out through the integration of religious values in conservation education through the ayatization/labelling approach, namely by quoting verses of the Qur'an that are relevant to the concept of conservation. The results of the study found that the implementation of conservation education containing religious values can improve environmental knowledge and awareness in prospective biology teacher students. The integration of religious values in conservation education builds a comprehensive understanding and provides a more binding moral encouragement so as to foster awareness and responsibility for the environment that is better than other approaches. The results of this study can be an alternative to an effective conservation education program so that it becomes a solution in the development of conservation education in Indonesia.

Keywords: Conservation education; Knowledge; Awareness; Religious values

Introduction

Environmental issues and loss of biodiversity have become a global concern. Efforts to reduce the rate of environmental and biodiversity damage have been made globally through various international agreements. Indonesia as a mega biodiversity country faces the challenge of environmental and biodiversity damage which continues to increase every year (Cleary & DeVantier, 2011; Chakrabarti, 2020; IBSAP, 2016). Environmental threats and loss of biodiversity are mostly caused by human activities (Dirzo et al., 2014; Ceballos et al., 2017). Other factors such as natural disasters, habitat destruction, habitat fragmentation, over-exploitation, the introduction of alien species, pollution, and environmental pollution play an important role in biodiversity loss (Hambler, 2004; Hunter & Gibbs, 2006; Groom et al., 2006; Sharma et al., 2018). Habitat destruction due to the conversion of forests to oil palm plantations and monoculture systems

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contributes greatly to environmental damage and loss of biodiversity (Feintrenie et al., 2010; Imanuddin et al., 2016).

To reduce the rate of environmental damage and biodiversity loss, it is necessary to make various planned efforts involving various stakeholders and comprehensive policies. In addition, efforts to build public awareness through education must be made by the government referring to the Convention on Biological Diversity (CBD) in Rio De Janeiro, Brazil in 1992 (Nations, 1992). Building public awareness through education can be an effective way to build awareness of the importance of environmental sustainability and biodiversity in society. Conservation education in formal and informal forms can be an effective solution. Education can build public awareness about the environment and biodiversity as per UNESCO's vision through Education for Sustainable Development (ESD) which raises environmental issues, climate change, biodiversity, and sustainability as the main issues in contemporary education (UNESCO, 2017).

Conservation education is an important issue in CBD that must be implemented from primary education to tertiary education. In the context of Indonesia as a mega biodiversity country, knowledge about the environment, biodiversity, and conservation must be an important concept in biology teaching at the elementary school level to the university level. So far, conservation education teaching has placed less emphasis on developing conservation literacy so the teaching carried out does not equip students to have a comprehensive understanding, attitudes, and conservation actions (Harmoko et al., 2024).

Biology teacher-candidate students' education plays an important role in building environmental and conservation awareness through appropriate educational facilities so that teacher-candidate students can transform their knowledge to their students and the wider community. Conservation education makes efforts to build environmental awareness and conservation can start from people's knowledge of the environment and biodiversity (Kaasinen, 2019; Wolff & Skarstein, 2020). Biology teachers play an important role in building public knowledge and awareness of the environment and biodiversity through appropriate conservation education.

Conservation education that is integrated with religious values is very appropriate to be implemented in Indonesia because the structure of the educational curriculum and Indonesian society, which has a strong religious culture, is very relevant to this concept (Parker, 2017). Environmental education (including conservation education) in the educational curriculum structure in Indonesia aims to develop knowledge, attitudes, and behaviors that respect the environment (Wakhidah & Erman, 2022). Ecology, environmental science, and conservation biology courses have relevance for inserting religious (Islamic) values to build knowledge and awareness among prospective biology teacher students as agents of change in society. Many concepts in the Qur'an are relevant to conservation education (Fakhruddin et al., 2018).

Religious values (religion) are important to be integrated into conservation education because religious teachings bind humans to implement them (Supriatna, 2018). Several concepts of religious values in conservation education include *ta'awun, mahabbah, ihsan,* and *qana'ah* (Rahman & Jalil, 2021). The integration of religious values in teaching is expected to be able to develop individuals who care about preventing environmental damage (Karim, 2022). Through conservation education programs containing religious values, it is expected that prospective biology teacher students will have good knowledge and high environmental awareness based on religious values so that they can implement environmental conservation concepts in their daily lives and transform conservation ideas to the wider community. Implementation of conservation education containing religious values can be a solution to conservation education at formal and non-formal education levels with the output of producing a generation of religious conservationists.

Although conservation education is important, its implementation in Indonesia remains largely ineffective. Current teaching methods often fail to emphasize comprehensive conservation literacy, thus inadequately equipping students with the necessary understanding, attitudes, and actions for conservation. Given Indonesia's strong religious culture, integrating religious values (particularly Islam) into conservation education presents a relevant approach. Religious teachings are perceived to provide a moral imperative or "binding" for pro-environmental behavior, offering a foundation for developing individuals who care about the environment. Therefore, this study aims to describe efforts to increase environmental knowledge and awareness among prospective biology teachers through a conservation education program incorporating religious values.

Method

This study used a quasi-experimental method to test the effectiveness of the interventions carried out. The research design used a one sample pre-test post-test group design, involving two groups, namely the experimental class and the control class (Fraenkel & Wallen, 2006). This research was conducted at the Biology Tadris UIN Siber Syekh Nurjati Cirebon in the 2023/2024 academic year. The subjects of the study were

fifth semester students who were divided into two classes, namely the experimental class (n = 31) and the control class (n = 31).

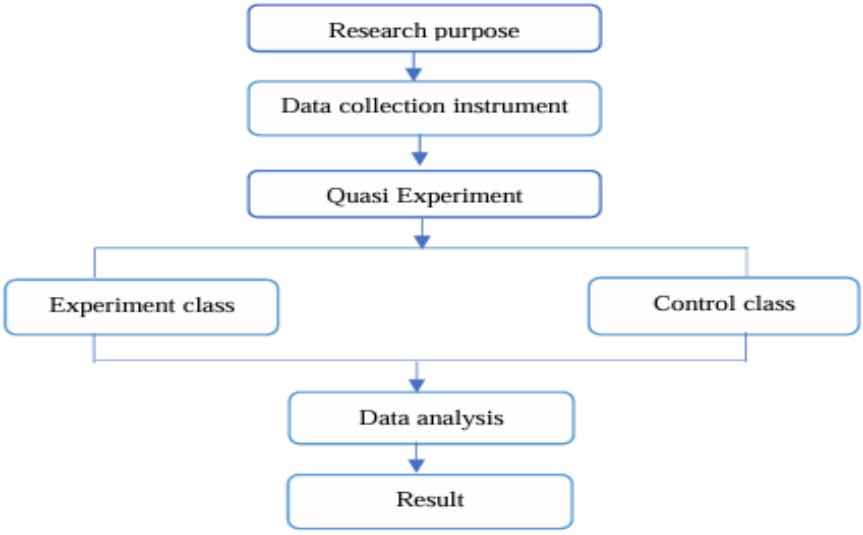

Figure 1. Research Stages

The research intervention was divided into two, namely the experimental class that implemented conservation education containing religious values with the ayatisasi/labeling method through quoting verses of the Qur'an that were in accordance with the concept of conservation and then interpreted according to the context of science. Meanwhile, the control class used an environmental approach without integrating religious values. The religious values developed in this study include monotheism, the role of humans as caliphs, mizan, fitrah, qana'ah, amanah, mahabbah, ikhsan and ta'awun (Zabidi et al., 2021).

The research instruments included a test to measure students' knowledge and a questionnaire to measure environmental awareness in prospective biology teacher students. The research data were analyzed using quantitative and qualitative analysis techniques. Quantitative data were analyzed statistically through t-tests and normalized gain tests to measure the increase in environmental knowledge. Qualitative data were analyzed by describing and interpreting them according to the findings.

Result and Discussion

Improving Environmental Knowledge Through Conservation Education Containing Religious Values

Environmental knowledge is an important asset for someone to understand the mechanism of how nature works, the balance of ecosystems, the impact of human activities on nature so that they can understand the urgency of preserving the environment. Knowledge about the environment is also an important factor in building awareness, attitudes, and pro-environmental behavior (Schneiderhan-Opel & Bogner, 2020). Providing environmental knowledge to students can be done through lecture programs such as environmental science, ecology, and conservation biology.

The study of the implementation of conservation education with religious values aims to determine the impact of providing environmental and conservation knowledge that is more effectively applied to prospective biology teacher students. In the experimental class, learning was carried out using a conservation education model with religious values with the ayatization/labelling method, while in the control class it was carried out through an environmental approach without integrating religious values in it. The results of the environmental knowledge achievement test are presented in Table 1.

Table 1. Environmental Knowledge Achievements

Data	Class	N	$\overline{X}$	S	Asym. Sig	Decision
Pre-test	Experiment	32	67.94	11.628	0,463	There is no significant difference
	Control	31	65.94	9.750		
Post-test	Experiment	32	83.69	5.474	0,000*	There is a significant difference
	Control	31	77.48	6.889		

Table 1 shows the knowledge achievement of prospective biology teacher students who participated in a conservation education program containing religious values (experiment) with regular conservation education (non-religious values). The research data (Table 1) shows a significant difference in knowledge achievement in both classes, so it can be concluded that conservation education that integrates religious values is more effective in providing knowledge about the environment and conservation. To identify the achievement of each indicator of knowledge obtained, an analysis of the achievement of each indicator of knowledge was carried out as follows.

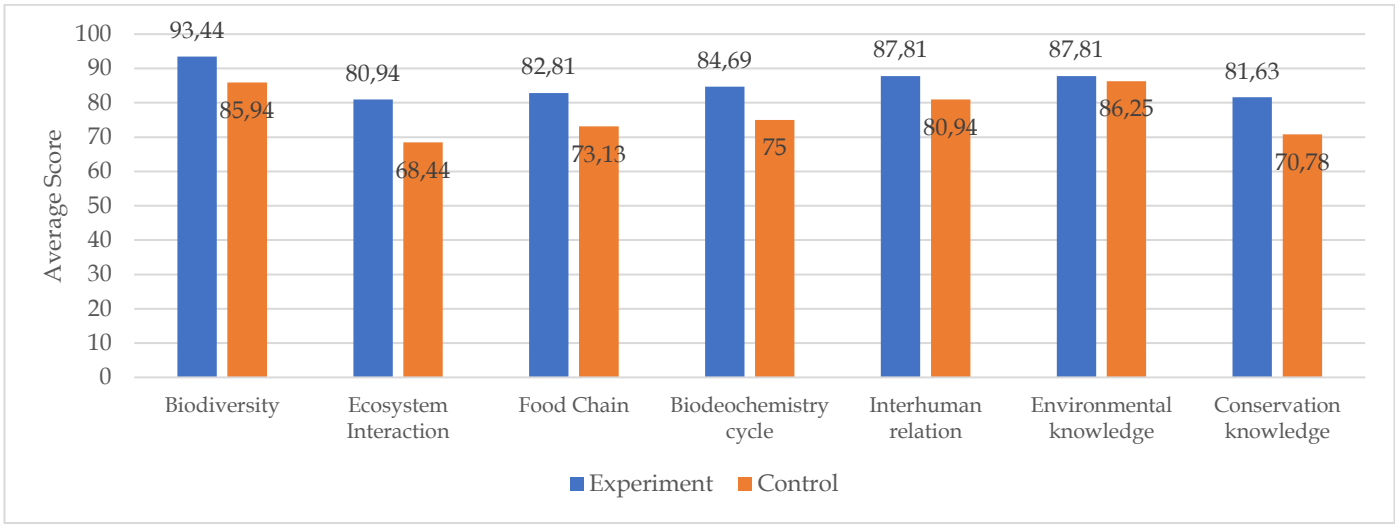

Figure 2. Achievement of Environmental Knowledge Indicators

The results of the study found that conservation education with religious values can improve environmental knowledge in students with several supporting factors, namely: (1) conservation education with religious values trains students to be able to identify scientific concepts that are relevant to related arguments/verses so that students learn the relationship between concepts and arguments more comprehensively, (2) religious aspects that are instilled in learning will build intrinsic motivation to understand and practice environmental understanding in personal life, (3) an approach that combines religious aspects can help students understand environmental and conservation concepts more holistically, seeing the relationship between spiritual, ecological, and social dimensions, (4) a religious perspective can enrich students' understanding of core concepts in conservation, such as the task of humans as caliphs in maintaining nature, the balance of nature, human responsibility, and the relationship between humans and nature.

The significant increase in knowledge in the experimental class (Table 1) aligns with the findings of Altmeyer, (2021); Fitriana et al., (2025), who found that integrating religious values into biology learning can enhance environmental knowledge and concern. The Qur'an itself contains many verses related to biodiversity, which can serve as a key knowledge source when these scriptural values are integrated into science learning (Blankinship et al., 2025).

Research conducted by Nuryantini, (2018) (Nuryantini, 2018) found that the integration of religious values in learning can improve the ability to identify relevant concepts and propositions. Conservation education with religious values also encourages better attitudes and faith, thus motivating students to be able to understand natural phenomena comprehensively (Gitmiwati & Indrayuda, 2024).

Religious values applied in conservation education can increase learners' trust in God Almighty, thus encouraging more active learning behavior. This certainly encourages the formation of better knowledge and behavior because moral values embedded through learning form a self-commitment in environmental conservation efforts (Johan et al., 2021; Sapanova et al., 2024). Religious teachings explicitly have a perspective on environmental issues and conservation. Many religious traditions have strong teachings about environmental involvement and human responsibility towards the environment (Arbuckle & Konisky, 2015; Hitzhusen & Tucker, 2013).

Improving Environmental Awareness Through Conservation Education Containing Religious Values

The conservation education program implemented in this study was carried out through environmental

observation activities and mangrove planting activities (experimental class). In the experimental class, the learning process was equipped with strengthening religious values with the ayatization method which was implemented through quoting verses of the Qur'an that were relevant to conservation in the lecture process. The verses of the Qur'an were quoted then linked to relevant conservation concepts and interpreted by bringing the interpretation closer to the context of the verses and the context of science. In the control class, lectures were conducted with an environmental approach. To determine the achievement of environmental awareness in the two classes tested, an assessment was carried out with the results presented in Figure 2.

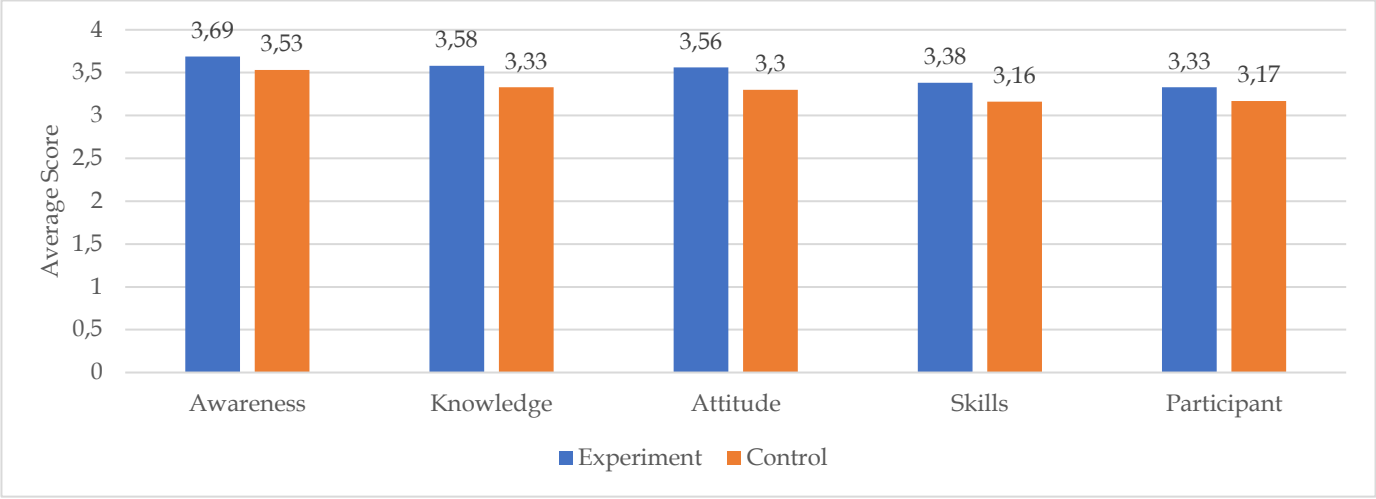

Figure 3. Achievement of Environmental Concern Among Participants

Based on Figure 3, it is known that the achievement of environmental awareness of UIN SSC Biology Tadris students who were surveyed showed that all indicators of environmental awareness were in the good category (score range 3-4). These findings can be explained by examining the intervention design. The treatment in the experimental class focused on the ayatization method (quoting and interpreting verses from the Qur'an) and classroom discussion. This method proved effective in building internal dimensions of awareness, such as attitudes and values, because it provided a strong moral and spiritual foundation.

However, the indicators for "Skills" and "Participation" received lower scores. Although the program included mangrove planting activities, these activities may not have been intensive enough to build in-depth technical conservation skills or long-term participation habits. The lower score on "Participation" indicates that increased awareness and attitudes do not automatically translate into concrete action without a continuous and structured field practice program. This highlights the need for more intensive "best practices" as mentioned previously.

Research by Fitriana et al., (2025) found that integrating religious values into environmental topics, such as air pollution and deforestation, had a positive effect on students' environmental responsibility and concern for nature. However, their findings also indicated that while all tested indicators were positive, achieving consistent environmentally friendly behavior requires continuous practice, a point supported by (Gök & Boncukçu, 2023; Al-Nuaimi & Al-Ghamdi, 2022).

Conservation education with religious values can develop positive values related to the environment, including: responsibility for God's creation, concern and empathy for the environment and fellow God's creations, living in harmony with nature, wisdom, and social awareness. Research that has been conducted shows that the integration of religious values in learning related to environmental conservation has a very positive impact on attitudes and behavior towards the environment (Wakhidah & Erman, 2022) and increases conservation knowledge and management (Fua et al., 2018).

Conservation education as an integral part of environmental education will build knowledge, awareness, and concern so that it can form behavior that supports conservation and sustainability efforts (Venuste et al., 2017; Aripin et al., 2021). Conservation education in higher education needs to be developed meaningfully and contextually so that it has a positive impact on pro-environmental behavior (Van Weelie & Wals, 2002; Dreyfus et al., 1999; Handayani et al., 2021). Pro-environmental attitudes must be encouraged in the younger generation so that sustainable development can continue. Religious conservation education basically aims to form a religious conservationist character in students so that it is hoped that this behavior will form a harmonious relationship between humans and nature that gives birth to progress and development of society.

Religious values provided in conservation education can become a doctrine that binds learners to obey, so that it can change attitudes and behavior in individuals who believe in these values (Efendi et al., 2017).

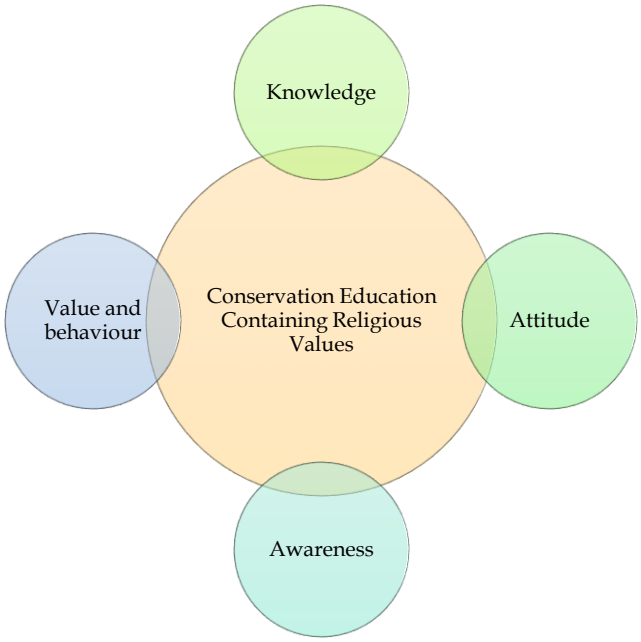

Figure 4. Impact of Religious Conservation Education

Figure 4 shows the impact of religious conservation education that has implications for increasing knowledge, values and attitudes, behavior and environmental awareness in research participants. In Islamic teachings, loving and protecting the environment is a manifestation of faith that is reflected in behavior as outlined in the Qur'an and Hadith (Talero, 2004; Zabidi et al., 2021). The amount of environmental damage shows that the lower the quality of faith, a person who has good faith will describe his behavior towards the environment (Fathil et al., 2015). Islamic boarding schools and educational institutions such as schools and universities have a central role in building religious awareness related to the environment and conservation (Fua et al., 2018). For this reason, conservation education should not only be taught in formal forms in schools but through non-formal institutions such as Islamic boarding schools.

Religious values derived from religious teachings are believed to have a major impact in influencing conservation efforts (Verschuuren, 2016; Mcleod & Palmer, 2015). Religious teachings can be ethical and moral guidelines in efforts to preserve nature as a mandate entrusted to humans (Mcleod & Palmer, 2015). Religious values will bind humans so that they can influence behavior and actions towards other living things (Negi, 2005). Tadris Biologi UIN Siber Syekh Nurjati Cirebon as an educational institution oriented towards Islamic values has a program in efforts to build conservation character through mangrove conservation practices.

The Cirebon region has several coastal areas that are currently damaged, thus requiring conservation efforts. One form of conservation education containing religious values that is implemented in learning is mangrove conservation in the coastal areas of Cirebon. This activity is an effort to empower coastal communities that involves collaboration between lecturers and students to disseminate ideas about sustainable conservation education. Mangrove conservation is urgently needed in the coastal areas of Cirebon that have experienced abrasion and shifting due to hydro-oceanography, coastal morphology, and human activities (Heriati & Husrin, 2017). This activity directly builds attitudes and active participation of students in efforts to increase environmental awareness in the younger generation.

Conclusion

The results of the study found that conservation education containing religious values has a positive contribution to increasing environmental knowledge and awareness in prospective biology teacher students. The strategy to integrate conservation education with religious values has an influence on the formation of environmental knowledge and awareness. The provision of religious values integrated into conservation education has a more morally binding impact on students to obey every command and prohibition taught by religion in preserving the environment. The results of this study can be one of the recommendations in developing conservation education programs in Indonesia because people in Indonesia are known to be religious so that integrating religious values in conservation education is expected to be able to build more comprehensive environmental knowledge, attitudes, and behavior because it is built on the basis of faith and piety towards God Almighty. Further research should involve a broader range of subjects and samples from non-PTKIN campuses.

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Author Contributions

D.M and I. A.: preparation of initial draft, results, discussion methodology, analysis, conclusion; D.M., J.A.M., I. A.: review, proofreading, and editing. All authors have read and approved the published version of the manuscript.

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Conflicts of Interest
Authors state no conflict of interest

References

Al-Nuaimi, S. R., & Al-Ghamdi, S. G. (2022). Assessment of Knowledge, Attitude and Practice towards Sustainability Aspects among Higher Education Students in Qatar. *Sustainability (Switzerland)*, *14*(20). https://doi.org/10.3390/su142013149

Altmeyer, S. (2021). Religious education for ecological sustainability: an initial reality check using the example of everyday decision-making. *Journal of Religious Education*, *69*(1), 57–74. https://doi.org/10.1007/s40839-020-00131-5

Arbuckle, M. B., & Konisky, D. M. (2015). The Role of Religion in Environmental Attitudes. *Social Science Quarterly*, *96*(5), 1244–1263. https://doi.org/10.1111/ssqu.12213

Aripin, I., Hidayat, T., Rustaman, N., & Riandi, R. (2021). Knowledge, Attitudes, and Behavior of Prospective Biology Teachers towards Biodiversity Conservation in Indonesia. *European Online Journal of Natural and Social Sciences*, *10*(3), 456–462. http://www.european-science.com456

Blankinship, L. A., Gillaspie, S., & Aboul-Enein, B. H. (2025). Highlighting the importance of biodiversity conservation through the Holy Qur'an. *Conservation Biology*, *39*(1), 1–8. https://doi.org/10.1111/cobi.14309

Ceballos, G., Ehrlich, P. R., & Dirzo, R. (2017). Biological annihilation via the ongoing sixth mass extinction signaled by vertebrate population losses and declines. *Proceedings of the National Academy of Sciences of the United States of America*, *114*(30), E6089–E6096. https://doi.org/10.1073/pnas.1704949114

Chakrabarti, A. (2020). Deforestation and infant mortality: Evidence from Indonesia. *Economics and Human Biology*, *40*, 100943. https://doi.org/10.1016/j.ehb.2020.100943

Cleary, D. F. R., & DeVantier, L. (2011). Indonesia: Threats to the Country's Biodiversity. *Encyclopedia of Environmental Health*, *01*(December 2011), 187–197. https://doi.org/10.1016/B978-0-444-52272-6.00504-3

Dirzo, R., Young, H. S., Galetti, M., Ceballos, G., Isaac, N. J. B., & Collen, B. (2014). Defaunation in the Anthropocene. *Science*, *345*(6195), 401–406. https://doi.org/10.1126/science.1251817

Dreyfus, A., Wals, A. E. J., van Weelie, D., & Weelie, D. van. (1999). Biodiversity as a Postmodern Theme for Environmental Education. *Canadian Journal of Environmental Education*, *4*(January 2015), 155–176. https://doi.org/10.1017/s0814062600003761

Efendi, M. H., Irawati, M. H., Rohman, F., & Gofur, A. (2017). Islamic View of Environmental Conservation Education in Pondok Pesantren Nurul Haramain Lombok Barat-Indonesia. *Journal of Education and Practice*, *8*(12), 137–140. www.iiste.org

Fakhruddin, A., Suryadi, A., Hakam, K. A., & Nurdin, E. S. (2018). The Development of Learning Content of Islamic Religious Education (IRE) Courses on Environmental Conservation in Higher Education. *IOP Conference Series: Earth and Environmental Science*, *145*(1). https://doi.org/10.1088/1755-1315/145/1/012125

Fathil, M., Saam, Z., Sukendi, S., & Nizar, S. (2015). Islam and Environment: Education Perspective. *Al-Ta Lim Journal*, *22*(2), 96–106. https://doi.org/10.15548/jt.v22i2.128

Feintrenie, L., Schwarze, S., & Levang, P. (2010). Are local people conservationists? Analysis of transition dynamics from agroforests to monoculture plantations in Indonesia. *Ecology and Society*, *15*(4). https://doi.org/10.5751/ES-03870-150437

Fitriana, F., Rahmatan, H., Evendi, E., Saminan, S., & Mentari, M. (2025). Integration of religious values in biology learning and its implications for students' environmental awareness. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, *11*(2), 716–727. https://doi.org/10.22219/jpbi.v11i2.40900

Fraenkel, J. R., & Wallen, N. E. (2006). *How to Design and Evaluate Research in Education*. McGraw-Hill, Inc.

Fua, J. La, Nurlila, R. U., Gunawan, F., & Wekke, I. S. (2018). Islamic Education on Formation of Environmental Awareness in Pondok Pesantren Indonesia. *IOP Conference Series: Earth and Environmental Science*, *156*(1). https://doi.org/10.1088/1755-1315/156/1/012035

Gitmiwati, & Indrayuda. (2024). Transformation of Learning in Madrasah through Innovations in Developing Environmental Care Character for Future Generations. *AL-ISHLAH: Jurnal Pendidikan*, *16*, 4349–4362. https://doi.org/10.35445/alishlah.v16i4.5837

Gök, G., & Boncukçu, G. (2023). The Effect Of Problem-Based Learning on Middle School Students' Environmental Literacy and Problem-Solving Skills. *Journal of Science Learning*, *6*(4), 414–423. https://doi.org/10.17509/jsl.v6i4.62781

Groom, M. J., Meffe, G. K., Carroll, C. R., & Contributors. (2006). *Principles of Conservation Biology Third Edition*. Sinauer Associates, Inc.

Hambler, C. (2004). *Conservation Studi in Biology*.

Cambridge University Press.
Handayani, W., Ariescy, R. R., Cahya, F. A., Yusnindi, S. I., & Sulistyo, A. (2021). *Literature Review: Environmental Awareness and Pro-Environmental Behavior*. *2021*, 170–173. https://doi.org/10.11594/nstp.2021.0925
Harmoko, H., Rohman, F., Sumitro, S. B., & Novianti, V. (2024). Unlocking the Essence of Conservation Literacy: A Systematic Literature Review. *International Journal of Sustainable Development and Planning*, *19*(11), 4203–4217. https://doi.org/10.18280/ijsdp.191110
Heriati, A., & Husrin, S. (2017). Perubahan Garis Pantai di Pesisir Cirebon Berdasarkan Analisis Spasial. *Reka Geomatika*, *2017*(2), 52–60. https://doi.org/10.26760/.v2017i2.1764
Hitzhusen, G. E., & Tucker, M. E. (2013). The potential of religion for Earth Stewardship. *Frontiers in Ecology and the Environment*, *11*(7), 368–376. https://doi.org/10.1890/120322
Hunter, M. L. J., & Gibbs, J. P. (2006). *Fundamentals of Conservation Biology, 3rd Edition*. Sinauer Associates, Inc.
IBSAP. (2016). *Indonesian Biodiversity Strategy and Action Plan (IBSAP) 2015-2020*. BAPPENAS.
Imanuddin, Persey, S., Priatna, D., D'Arcy, L., Sadikin, L., & Zrust, M. (2016). *A Practical Toolkit For Identifying And Monitoring Biodiversity In Oil Palm Lanscapes* (Vol. 4, Issue 1).
Johan, H., Mayub, A., & Sipriyadi. (2021). Student Spiritual Value Through Environmental Science Learning. *Proceedings of the International Conference on Educational Sciences and Teacher Profession (ICETeP 2020)*, *532*(532), 210–213. https://doi.org/10.2991/assehr.k.210227.037
Kaasinen, A. (2019). Plant species recognition skills in finnish students and teachers. *Education Sciences*, *9*(2). https://doi.org/10.3390/educsci9020085
Karim, A. (2022). Integration of Religious Awareness in Environmental Education. *Qudus International Journal of Islamic Studies*, *10*(2), 415–442. https://doi.org/10.21043/qijis.v10i2.14404
Mcleod, E., & Palmer, M. (2015). Why Conservation Needs Religion. *Coastal Management*, *43*(3), 238–252. https://doi.org/10.1080/08920753.2015.1030297
Nations, U. (1992). Convention on Biological Diversity. In *United Nations*. https://www.cbd.int/doc/legal/cbd-en.pdf
Negi, C. S. (2005). Religion and biodiversity conservation: not a mere analogy. *International Journal of Biodiversity Science & Management*, *1*(2), 85–96. https://doi.org/10.1080/17451590509618083
Nuryantini, A. Y. (2018). Integration Science and Religion: An Analysis in Islamic Higher Education. *TARBIYA: Journal of Education in Muslim Society*, *5*(1), 11–18. https://doi.org/10.15408/tjems.v5i1.9508
Parker, L. (2017). Religious environmental education? The new school curriculum in Indonesia. *Environmental Education Research*, *23*(9), 1249–1272. https://doi.org/10.1080/13504622.2016.1150425
Rahman, N. A., & Jalil, M. H. (2021). Awareness of the Role of "Religious People" in Environmental Conservation from the Perspective of Islamic Studies Students. *Creative Education*, *12*(08), 1755–1772. https://doi.org/10.4236/ce.2021.128133
Sapanova, N., Cessna, S., DeChano-Cook, L. M., Childibaev, D., & Balta, N. (2024). Kazakhstani high school students' environmental knowledge, attitudes, awareness and concern. *International Research in Geographical and Environmental Education*, *33*(2), 139–156. https://doi.org/10.1080/10382046.2023.2281697
Schneiderhan-Opel, J., & Bogner, F. X. (2020). The relation between knowledge acquisition and environmental values within the scope of a biodiversity learning module. *Sustainability (Switzerland)*, *12*(5). https://doi.org/10.3390/su12052036
Sharma, R., Nehren, U., Rahman, S. A., Meyer, M., Rimal, B., Seta, G. A., & Baral, H. (2018). Modeling land use and land cover changes and their effects on biodiversity in Central Kalimantan, Indonesia. *Land*, *7*(2), 1–14. https://doi.org/10.3390/land7020057
Supriatna, J. (2018). *Konservasi Biodiversitas Teori dan Praktik di Indonesia*. Yayasan Obor Indonesia.
Talero, G. (2004). Environment Education and Public Awareness. *Anthropologist*, *6*(February), 1–12. https://doi.org/10.21154/altahrir.v17i2.1035
UNESCO. (2017). *Reading the past, writing the future*.
Van Weelie, D., & Wals, A. E. J. (2002). Making biodiversity meaningful through environmental education. *International Journal of Science Education*, *24*(11), 1143–1156. https://doi.org/10.1080/09500690210134839
Venuste, N., Olivier, H., & Valens, N. (2017). Knowledge , Attitudes and Awareness of Pre- Service Teachers on Biodiversity Conservation in Rwanda. *International Journal of Environmental and Science Education*, *12*(April), 643–652.
Verschuuren, B. (2016). Religious and Spiritual Aspects of Wetland Management. In *The Wetland Book*. Springer Science. https://doi.org/10.1007/978-94-007-6172-8
Wakhidah, N., & Erman, E. (2022). Examining environmental education content on Indonesian Islamic religious curriculum and its implementation in life. *Cogent Education*, *9*(1).

https://doi.org/10.1080/2331186X.2022.2034244

Wolff, L. A., & Skarstein, T. H. (2020). Species learning and biodiversity in early childhood teacher education. *Sustainability (Switzerland)*, *12*(9), 9–11. https://doi.org/10.3390/su12093698

Zabidi, F. N. M., Abd Rahman, N., & Halim, L. (2021). Integration of islamic values for environmental conservation: An analysis of school textbooks. *Religions*, *12*(7), 1–18. https://doi.org/10.3390/rel12070509