



Qur'anic Ecological Literacy and Pro-Environmental Awareness among Muslim Students through Fasad, Ishlah, Khalifah, Amanah, Mizan

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ABSTRACT

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Purpose: This study examines Qur'anic Ecological Literacy and Pro-Environmental Awareness among Muslim students in Palopo, Indonesia. It is grounded in the increasing urgency of ecological crises, which are not only environmental problems but also ethical, educational, and spiritual challenges. While previous studies have widely discussed environmental literacy, religiosity, and pro-environmental behaviour, limited attention has been given to how Muslim students subjectively interpret Qur'anic ecological concepts in shaping their environmental awareness. Therefore, this study aims to explore how Muslim students construct ecological meaning through the concepts of fasad, ishlah, khalifah, amanah, and mizan.

Design/methodology/approach: This study employed a qualitative phenomenological research design. Data were collected from 30 Muslim students in Palopo through observation, in-depth interviews, focus group discussions, and supporting textual analysis. The data were transcribed verbatim, coded, and analyzed using thematic analysis with the assistance of NVivo. The analysis focused on participants' lived experiences, subjective meanings, and phenomenological interpretations of Qur'anic ecological values in relation to everyday environmental practices.

Findings/Results: The findings reveal five major themes: the environment as a divine trust, fasad as ecological and spiritual crisis, ishlah as ecological restoration, ambivalence between Qur'anic knowledge and ecological practice, and campus and local ecological experiences as spaces for environmental awareness formation. The study shows that Qur'anic ecological literacy functions as an interpretative bridge between religious texts, ecological experience, moral reflection, and pro-environmental awareness.

Originality: This study contributes to Islamic environmental ethics, ecological literacy, and phenomenological studies by demonstrating that Muslim students' pro-environmental awareness is shaped not only by environmental knowledge but also by religious meaning, local ecological experience, and institutional support. Its practical implication is the need to develop Qur'an-based environmental education that is reflective, contextual, and action-oriented.

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1. INTRODUCTION

The contemporary ecological crisis has developed into a multidimensional problem that is not only related to the degradation of the physical environment, but also to crises of knowledge, ethics, spirituality, and human behavior. Globally, the Intergovernmental Panel on Climate Change emphasizes that human activities have caused global warming of approximately 1.1°C during the period 2011–2020 compared to the period 1850–1900, so climate change can no longer be understood as a hypothetical threat, but as an ecological reality that has affected natural systems and human social life (IPCC, 2023). Moreover, the United Nations Environment Programme reports that to maintain the possibility of limiting global warming to 1.5°C, global greenhouse gas emissions must be reduced by 42% by 2030 and 57% by 2035; without increased climate ambition, the world could be heading toward a temperature increase of 2.6–3.1°C this century (UNEP, 2024). These facts show that the environmental crisis is a global problem that demands a paradigm shift from a technocratic approach toward a more holistic approach, including educational, cultural, religious, and moral awareness approaches.

In the Indonesian context, this ecological urgency becomes even stronger because hydrometeorological disasters remain a dominant threat. The National Disaster Management Agency recorded that in 2024 disasters in Indonesia caused 540 deaths, 63 missing persons, 11,531 injuries, and 8,136,271 people affected and displaced; these disasters also damaged 80,304 houses, 612 educational facilities, 415 places of worship, 82 health facilities, 89 offices, and 445 bridges (BNPB, 2025). These data show that the ecological crisis not only affects the natural environment, but also disrupts the education system, socio-religious life, public health, and the basic infrastructure of society. Therefore, strengthening ecological awareness among the community, especially educated young people, has become an important agenda in building socio-ecological resilience in Indonesia.

Palopo City is a relevant local context for examining the relationship between Qur'anic ecological literacy and pro-environmental awareness among Muslim students. BNPB reported that in March 2024 floods as high as 60–150 cm struck Pentojangan and Salubattang Subdistricts in Telluwanua District as well as Mawa Subdistrict in Sendana District, affecting 88 houses and 88 households; at the same time, landslides also occurred on Jalan Poros Latuppa KM 08, Latuppa Subdistrict, Mungkajang District, due to heavy rainfall (BNPB, 2024). This context shows that Palopo is not merely an administrative location for the study, but a socio-ecological space that directly experiences the impacts of environmental vulnerability. Under such conditions, Muslim students as a young intellectual group have a strategic position because they are located at the intersection of higher education, religious identity, and social responsibility toward the environment.

However, the main research problem in this study is that there is still a gap between the normative teachings of Islam on environmental preservation and the ecological awareness that lives in the experiences of Muslim students. The Qur'an contains various ecological concepts such as *fasad* as destruction, *ishlah* as restoration, *khalifah* as responsibility for managing the earth, *amanah* as a moral mandate, and *mizan* as the principle of balance. The basic article that serves as the foundation of this study emphasizes that the environment in the Qur'an is not only understood as a matter of physical preservation, but also includes theological, ethical, political dimensions and human responsibility toward nature through the concepts of *fasad*, *ishlah*, *isti'mar*, *hifz*, and *ri'ayah* (Saukani, n.d.). However, this study is still dominantly based on thematic-normative interpretation, so it has not explained how these Qur'anic ecological concepts are understood, interpreted, and internalized by Muslim students in everyday life amid local ecological realities.

Previous studies show that environmental education and religiosity have an important relationship with pro-environmental behavior. Begum et al. (2021) found that environmental moral education affects students' pro-

environmental behavior, while psychological empowerment acts as a mediator and Islamic religiosity acts as a moderator in this relationship (Begum et al., 2021). Suárez-Perales et al. (2021) also showed that environmental education in higher education can influence pro-environmental behavior indirectly through a model of knowledge, concern, and willingness to act (Suárez-Perales et al., 2021). In addition, Zhang et al. (2022), through a cross-cultural study in Pakistan and Malaysia, showed that Islamic religiosity can strengthen the relationship between environmental attitudes, subjective norms, and intention to purchase products with recycled packaging (Zhang et al., 2022).

The state of the art in the last five years also shows that studies on students, environmental education, and pro-environmental behavior continue to develop. Örs (2022) emphasizes that environmental literacy includes knowledge, attitudes, concern, and ecological use or action, so higher education has a responsibility to form academic citizens who are able to make ecological decisions responsibly (Örs, 2022). Saulick et al. (2024) showed that although many students have positive attitudes toward environmental protection, only some actually change their behavior into active pro-environmental behavior (Saulick et al., 2024). Zhao et al. (2024) even emphasized that environmental education based on direct contact with nature can improve students' pro-environmental behavior through environmental attitudes and environmental responsibility as mediating mechanisms (Zhao et al., 2024). These findings show that education, experience, and moral values are important factors in shaping the ecological awareness of the younger generation.

Nevertheless, there are important research gaps that have not been adequately answered by previous studies. First, most previous studies are still quantitatively oriented by examining relationships between variables such as religiosity, environmental education, attitudes, intentions, and pro-environmental behavior, but have not deeply explored the subjective experiences of Muslim students in interpreting the ecological teachings of the Qur'an. Second, research on Islam and sustainability still tends to move around the general theme of sustainability, while the integration between deeper theological principles and empirical ecological practices remains limited; this is also evident in the bibliometric analysis by Husamah et al. (2025), which shows that although Islam and sustainability have become central themes, the integration of deep theological principles with empirical environmental practices remains limited (Husamah et al., 2025). Third, the cross-country study by Zafar and Abu-Hussin (2025) proves that religiosity can be a positive predictor of Muslim pro-environmental behavior in Muslim-majority countries, but the study has not explained how religious meaning is formed in the local experiences of Muslim students (Zafar & Abu-Hussin, 2025).

Based on these gaps, the novelty of this study lies in the development of the study of Qur'anic Ecological Literacy and Pro-Environmental Awareness through a phenomenological approach among Muslim students in Palopo City. Unlike previous studies that generally position religiosity as a quantitative variable, this study positions the concepts of *fasad*, *ishlah*, *khalifah*, *amanah*, and *mizan* as horizons of meaning that are constructed, experienced, and negotiated by Muslim students in responding to environmental issues. Thus, this study does not only ask whether religiosity affects environmental behavior, but how Muslim students understand the ecological teachings of the Qur'an, how that understanding shapes pro-environmental awareness, and why such awareness can or cannot be realized in everyday practice.

This study aims to explore the lived experiences of Muslim students in Palopo in constructing Qur'anic ecological literacy and pro-environmental awareness through the concepts of *fasad*, *ishlah*, *khalifah*, *amanah*, and *mizan*. Specifically, this study aims to analyze Muslim students' interpretation of Qur'anic ecological concepts, explain the forms of pro-environmental awareness that emerge from that interpretation, and identify social, educational, religious, and campus environmental factors that support or hinder the internalization of

Islamic ecological values. A phenomenological approach was chosen because it is able to reveal the structure of experience, consciousness, and meaning that cannot be reduced to statistical numbers.

The significance of this study includes theoretical and practical contributions. Theoretically, this study expands the study of ecological interpretation and Islamic education by presenting qualitative empirical evidence regarding how Qur'anic ecological concepts live in the consciousness of Muslim students. Practically, this study can serve as a basis for higher education institutions, Islamic Religious Education lecturers, campus da'wah institutions, and local policymakers in Palopo City to design environmental education based on Qur'anic values that is more contextual, reflective, and transformative. Thus, this study is expected to contribute to strengthening Islamic ecotheology, sustainability education, and the formation of a Muslim generation that possesses ecological awareness based on knowledge, faith, and social responsibility.

2. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1. Concept Qur'anic Ecological Literacy

Qur'anic ecological literacy in this study is understood as the ability of Muslim students to understand, interpret, and reflect on the ecological values of the Qur'an in shaping environmental awareness. This concept does not only refer to cognitive knowledge of environmental verses, but also includes ethical-spiritual meaning-making regarding the relationship between humans, nature, and God. Within this framework, Qur'anic ecological literacy differs from general environmental literacy because its epistemological basis does not solely derive from environmental science, but also from Qur'anic concepts such as *fasad*, *ishlah*, *khalifah*, *amanah*, and *mizan*. The basic manuscript of this study shows that the Qur'an views the environment not only as a physical object that must be preserved, but as a theological, ethical, social, and political space of trust that demands human responsibility as *khalifah* on earth.

From the perspective of ecological interpretation, *fasad* refers to destruction, imbalance, and deviation from the order willed by Allah. Conversely, *ishlah* indicates the process of repairing, maintaining, and restoring such destruction. The concept of *khalifah* provides a normative basis that humans do not have absolute rights over nature, but rather a mandate to manage the earth responsibly. Meanwhile, *amanah* shows the moral dimension of ecological responsibility, and *mizan* affirms the principle of cosmic balance that must not be violated by exploitative human behavior. Therefore, Qur'anic ecological literacy can be positioned as literacy that connects religious knowledge, moral awareness, and ecological responsibility in everyday life.

When compared with the concept of environmental literacy in environmental education studies, Qur'anic ecological literacy has a distinctive character in its source of values and ethical orientation. Örs (2022) explains that environmental literacy includes the dimensions of knowledge, attitudes, concern, and behavior toward the environment, so environmental literacy is not sufficient to be understood only as mastery of ecological information, but must be followed by an orientation toward responsible action (Örs, 2022). However, the concept remains secular and does not specifically explain how religious values shape ecological meaning-making. It is here that Qur'anic ecological literacy has a different position, because it does not only ask the extent to which students know environmental issues, but how they interpret environmental destruction as a form of *fasad*, ecological restoration as *ishlah*, and ecological responsibility as part of the *amanah* of vicegerency.

2.2. Concept Pro Environmental Awareness

Pro-environmental awareness can be understood as an individual's awareness of the importance of protecting the environment, understanding the impact of human behavior on nature, and having a moral orientation to act in an environmentally friendly manner. In this study, the concept is not treated as a quantitative variable measured through numbers, but as an experience of consciousness constructed by Muslim students through the interaction between knowledge, religious beliefs, social experiences, and local ecological conditions. Thus, pro-environmental awareness is understood as reflective awareness that enables students to see the relationship between everyday behavior, Qur'anic teachings, and the sustainability of life.

Previous studies show that pro-environmental awareness among students is often associated with environmental knowledge, attitudes, intentions, institutional support, and educational experiences. Suárez-Perales et al. (2021) found that environmental education in higher education can influence pro-environmental behavior, but this influence works indirectly through a model of knowledge, concern, and willingness to act (Suárez-Perales et al., 2021). Torroba Díaz et al. (2023) also showed that students' environmental behavior is formed through the relationship between environmental intelligence, knowledge, attitudes, and behavior, although they emphasized that previous studies still often analyze these factors separately (Torroba Díaz et al., 2023). Thus, recent literature emphasizes that students' ecological awareness cannot be explained only through knowledge, but must be seen as a process of meaning formation involving cognitive, affective, moral, and institutional dimensions.

However, in the context of Muslim students, pro-environmental awareness cannot be separated from the religious dimension. Begum et al. (2021) found that environmental moral education influences pro-environmental behavior, while psychological empowerment acts as a mediator and Islamic religiosity acts as a moderator in this relationship (Begum et al., 2021). This finding is important because it shows that religiosity is not only a symbolic identity, but can function as a source of moral motivation in the formation of ecological behavior. Nevertheless, the study still used a quantitative approach, so it has not explained in depth how Muslim students interpret religious values in everyday ecological experiences.

2.3. Grand Theory and Supporting Theory

The grand theory used in this study is Islamic environmental ethics, namely an Islamic ethical framework that positions humans as moral beings responsible for maintaining the balance of Allah's creation. Within this framework, nature is not merely an economic resource, but part of the signs of Allah's power that must be treated with spiritual responsibility. The concept of tawhid affirms the unity of creation; khalifah affirms the mandate of stewardship; amanah affirms moral responsibility; mizan affirms balance; and fasad marks human deviation from the principle of balance. Therefore, Islamic environmental ethics does not only regulate what may and may not be done to nature, but also shapes the way humans understand themselves as moral subjects in the cosmos.

As supporting theories, this study uses ecological literacy theory and the phenomenological theory of lived experience. Ecological literacy theory is useful for understanding how students build knowledge and awareness of the relationship between humans and the environment. However, because this study is based on the Qur'an, ecological literacy is expanded into Qur'anic ecological literacy, namely the ability to read ecological reality through the horizon of Qur'anic values. Meanwhile, the phenomenological approach is used because this study does not aim to test the influence between variables, but to reveal the lived experiences, subjective meaning-making, and structure of consciousness of Muslim students toward environmental issues. Frechette et al. (2020) emphasize that interpretative phenomenology aims to capture lived experience from the perspective of how participants interpret and give meaning to their existence (Frechette et al., 2020).

The phenomenological approach is also relevant because ecological awareness does not always appear in the form of behavior that is easy to measure. De Boer and Zeiler (2024) explain that qualitative critical phenomenology can be used to understand how lived experience is shaped by social norms, cultural structures, and certain reflective conditions (De Boer & Zeiler, 2024). In the context of this study, the ecological experiences of Muslim students cannot be separated from religious norms, campus experiences, the social conditions of Palopo City, and their relationship with disasters, waste, water, green spaces, and everyday consumption practices. Therefore, phenomenology enables this study to understand not only "what students know about the environment," but also "how students experience and interpret ecological responsibility as part of being Muslim."

2.4. Analysis of Previous Studies and the Position of the Current Study

Previous studies in the last five years show that studies on environmental literacy, higher education, religiosity, and students' pro-environmental behavior have developed significantly, especially in explaining how knowledge, attitudes, moral values, and institutional support influence the ecological awareness of the younger generation. Wang and Zhang (2021) used the Knowledge-Attitude-Practice model to explain that

environmental knowledge can shape environmental attitude and subsequently encourage students' pro-environmental behavior; this study strengthens the assumption that ecological knowledge is an important prerequisite in environmental education (Wang & Zhang, 2021). However, this approach still tends to be linear because it assumes that knowledge will move directly toward attitudes and behavior, whereas students' ecological awareness is often also influenced by lived experiences, religious values, campus culture, social conditions, and the local context in which they interact with environmental issues. Thus, the KAP model provides an important foundation, but is not sufficient to explain the subjective and spiritual dimensions of Muslim students' ecological awareness.

The study by Suárez-Perales et al. (2021) expands this discussion by showing that environmental education in higher education affects pro-environmental behavior, but its effect is indirect through knowledge, concern, and willingness to act (Suárez-Perales et al., 2021). This finding is important because it shows that environmental education does not automatically produce ecological behavior, but requires a process of internalizing values and awareness. In line with this, Saulick et al. (2024) found that although students have positive attitudes toward environmental protection, not all students are at the same stage of readiness to transform such attitudes into real action (Saulick et al., 2024). These inconsistent findings reveal a gap between ecological knowledge, attitudes, awareness, and actions. Therefore, qualitative studies are needed to understand why some students are able to internalize ecological values into action, while others stop at the level of knowledge and attitudes.

In the context of religiosity, Begum et al. (2021) found that environmental moral education affects pro-environmental behaviour, while psychological empowerment serves as a mediator and Islamic religiosity functions as a moderator in this relationship (Begum et al., 2021). This finding shows that Islamic religiosity can strengthen students' moral orientation toward the environment. Zhang et al. (2022) also showed that Islamic religiosity plays a role in shaping attitudes and intentions toward products with recycled packaging in the cross-cultural context of Pakistan and Malaysia (Zhang et al., 2022). More broadly, Zafar and Abu-Hussin (2025), through a cross-country analysis of Muslim respondents, showed that religiosity is positively related to environmental protection orientation, although this relationship is influenced by socio-economic context and the position of religion in society (Zafar & Abu-Hussin, 2025). These three studies strengthen the position of religion as an important factor in shaping ecological awareness. However, these studies still tend to position religiosity as a general variable, rather than as a Qur'anic meaning system constructed through the lived experiences of Muslim students.

Recent research developments also show increasing attention to the role of higher education institutions in shaping students' ecological behavior. Ullah et al. (2024) emphasized that environmental education, green campus initiatives, institutional ecosystem, and institutional support system affect students' green intention and green behavior (Ullah et al., 2024). This finding shows that ecological behavior is not only determined by individual awareness, but also by an institutional environment that provides facilities, policies, and a culture of sustainability. In addition, Akakpo et al. (2024) found that climate change knowledge and information literacy self-efficacy are related to students' pro-environmental behavior, while climate anxiety does not always correlate directly with pro-environmental behavior (Akakpo et al., 2024). These findings show that ecological knowledge needs to be translated through mechanisms of meaning-making, literacy, and personal agency in order to shape ecological awareness and action.

The state of the art of current research is moving in three main directions. First, environmental education studies no longer emphasize only the transfer of knowledge, but have begun to examine processes of internalization, readiness to act, psychological commitment, and institutional support as factors shaping students' ecological behavior. Second, studies on religion and the environment increasingly position religiosity as an important factor in shaping ecological attitudes, intentions, and behavior, especially in Muslim societies. Third, studies on Islam and sustainability have begun to develop bibliometrically, but have not fully integrated deep Islamic theological concepts with empirical environmental experiences. Husamah et al. (2025) showed that publications on Islam and sustainability in the Scopus database have increased since 2008 and reached their peak in 2023, but the relationship between theological concepts such as tawhid, khalifah, and empirical sustainability practices remains relatively weak (Husamah et al., 2025). This finding confirms that studies on

Islam and the environment require an approach that is not only normative, but also empirical, contextual, and based on social experience.

Based on this synthesis, the research gap of this study can be formulated in four main aspects. First, studies on environmental literacy and pro-environmental behavior among students are still dominated by quantitative approaches, so they have not sufficiently explained lived experiences, subjective meaning, and the process of internalizing ecological values in students' consciousness. Second, many studies on religiosity and environmental behavior still treat religiosity as a general psychological variable, rather than as a horizon of Qur'anic meaning consisting of the concepts of *fasad*, *ishlah*, *khalifah*, *amanah*, and *mizan*. Third, studies on ecological interpretation of the Qur'an remain dominantly normative-conceptual and have not been widely connected to the empirical experiences of Muslim students as social actors facing local ecological issues. Fourth, previous studies still rarely examine Muslim students in small-to-medium cities such as Palopo City, even though local context is very important in shaping ecological experiences, environmental perceptions, and students' religious awareness.

The position of this study is to bridge studies on ecological interpretation of the Qur'an, ecological literacy, Islamic education, and the phenomenology of environmental consciousness. Unlike quantitative studies that measure the relationship between religiosity and ecological behavior, this study does not position religiosity as a number, but as a source of meaning that is experienced, interpreted, and negotiated by Muslim students. Unlike thematic interpretation studies that stop at textual analysis, this study brings Qur'anic concepts into the social experience of students in Palopo City. This study proposes that Qur'anic ecological literacy is a conceptual framework that can explain how Muslim students understand environmental destruction as *fasad*, interpret ecological restoration as *ishlah*, interpret the position of humans as *khalifah*, understand ecological responsibility as *amanah*, and see sustainability as part of the principle of *mizan*. Thus, the novelty of this study lies in the use of a phenomenological approach to reveal the essence of experience of Muslim students in building pro-environmental awareness based on Qur'anic ecological literacy.

Conceptually, this study positions the ecological concepts of the Qur'an as a horizon of values that shapes Qur'anic ecological literacy, and this literacy then influences the way Muslim students understand, feel, and reflect on pro-environmental responsibility in everyday life. However, this relationship is not understood in a causal-linear manner as in quantitative research, but as an interpretive relationship between sacred text, ecological experience, religious consciousness, and social context. Therefore, this study does not formulate hypotheses, but proposes an analytical proposition that Muslim students' pro-environmental awareness is formed through the interaction between Qur'anic understanding, lived experience, campus environment, and the local ecological reality of Palopo City.

3. METHODOLOGY

This study uses a qualitative approach with a phenomenological research design to understand the lived experiences, perceptions, and subjective meaning of Muslim students regarding the phenomenon of Qur'anic Ecological Literacy and Pro-Environmental Awareness in Palopo City. Philosophically, this study is based on the interpretivist-constructivist paradigm and the orientation of hermeneutic phenomenology, because the reality of students' ecological awareness is understood as a construction of meaning formed through religious experiences, social interaction, education, and the local ecological context. The phenomenological approach was chosen because this study does not aim to test relationships between variables statistically, but to interpret how Muslim students understand Qur'anic ecological concepts such as *fasad*, *ishlah*, *khalifah*, *amanah*, and *mizan* in shaping pro-environmental awareness. This orientation is in line with the view that interpretive phenomenology is used to explore participants' lived experiences and reveal the essence of experience of a phenomenon experienced subjectively (Frechette et al., 2020). In addition, qualitative phenomenology enables researchers to understand how individual experiences are influenced by social norms, culture, values, and certain structures of life (De Boer & Zeiler, 2024). In the context of this study, the ecological concepts of the Qur'an are used as an interpretive horizon because the basic article shows that the environment in the Qur'an is related to theological, ethical, and social dimensions, as well as human responsibility as *khalifah*.

The study was conducted in Palopo City, South Sulawesi, involving 30 Muslim students who were pursuing higher education. Participants were selected using purposive sampling with the following criteria: active students, Muslim, having experience or concern regarding environmental issues, having received Islamic Religious Education or environmental education, and being willing to participate in the research process voluntarily. If necessary, snowball sampling was used in a limited manner to reach students who were active in religious organizations, environmental communities, or campus social activities. Data were collected through observation, in-depth interviews, focus group discussions, and supporting text analysis. Observation was directed at students' ecological practices, such as habits of disposing of waste, use of single-use plastics, concern for campus cleanliness, and use of water and electricity. In-depth interviews were conducted semi-structurally to explore students' personal experiences in understanding environmental degradation, the meanings of fasad and islah, human responsibility as khalifah, and the relationship between Qur'anic teachings and pro-environmental behavior. FGD was used to capture the construction of collective meaning regarding ecological responsibility from the perspective of Muslim students, while supporting text analysis was conducted on Qur'anic verses, Islamic Religious Education materials, campus documents, environmental programs, and ecological interpretation literature. All interviews and FGDs were recorded with participants' consent, then transcribed verbatim, anonymized using participant codes, and organized using NVivo to assist the processes of data management, coding, categorization, and thematic pattern searching.

Data analysis was conducted using phenomenologically oriented thematic analysis to identify the main themes that represent Muslim students' experiences in constructing Qur'anic ecological literacy and pro-environmental awareness. Thematic analysis was chosen because it is flexible, systematic, and able to identify patterns of meaning in qualitative data in depth (Braun & Clarke, 2006). The analysis process was carried out through repeated reading of transcripts, initial coding, grouping codes into categories, theme development, and phenomenological interpretation to find the essence of experience. Coding was conducted through the stages of open coding, axial coding, and selective coding, so that the emerging themes were not forced from theory, but developed inductively from participants' experiences and interpreted through Qur'anic concepts. Data validity was maintained through source triangulation, technique triangulation, member checking, peer debriefing, and audit trail, because strong thematic analysis requires systematic procedures to maintain credibility, dependability, confirmability, and transferability (Nowell et al., 2017). Ethical consideration was applied through informed consent, confidentiality of participants' identities, participants' right to withdraw, secure data storage, and sensitivity to religious values and local culture during the research process.

4. RESULT AND DISCUSSION

This section integrates the research findings and discussion interpretively based on qualitative data obtained through observation, in-depth interviews, focus group discussions (FGD), and supporting text analysis involving 30 Muslim students in Palopo City. Informants were coded as P1–P30 to maintain anonymity, while the data were analyzed using NVivo-assisted thematic analysis. The coding process produced five emerging themes, namely: the environment as a divine trust, fasad as an ecological and spiritual crisis, islah as an act of ecological restoration, ambivalence between Qur'anic knowledge and ecological practice, and the campus and Palopo City as spaces for the formation of ecological awareness. These findings show that Qur'anic Ecological Literacy among Muslim students is not only formed through textual knowledge of environmental verses, but through a process of meaning-making that connects Qur'anic concepts, local ecological experiences, religious identity, and everyday practices. This framework is consistent with the research objective, which positions the concepts of fasad, islah, khalifah, amanah, and mizan as horizons of meaning in understanding the Pro-Environmental Awareness of Muslim students in Palopo City.

4.1. Coding, Thematic Categories, and Interpretative Meaning

The coding results show that the field data moved from initial codes toward thematic categories and then formed the main themes. This coding pattern reveals that the ecological awareness of Muslim students does not appear as a single form of awareness, but as a construction of meaning influenced by religious knowledge, local experiences, campus practices, and the socio-ecological conditions of Palopo City. Briefly, the thematic structure of the study can be presented as follows.

Tabel 1. Coding, Thematic Categories, and Interpretative Meaning

Initial Codes	Thematic Categories	Main Themes
Lingkungan ciptaan Allah, alam sebagai titipan, menjaga bumi bagian dari ibadah	Kesadaran teologis terhadap lingkungan	Lingkungan sebagai amanah ilahi
Sampah, banjir, perilaku merusak, eksploitasi alam, kelalaian manusia	Pemaknaan <i>fasad</i> sebagai kerusakan ekologis dan moral	<i>Fasad</i> sebagai krisis ekologis dan spiritual
Menanam pohon, mengurangi plastik, menjaga kebersihan, hemat air	Praktik <i>ishlah</i> dalam kehidupan sehari-hari	<i>Ishlah</i> sebagai tindakan pemulihan ekologis
Tahu ajaran agama tetapi belum konsisten, fasilitas kurang, budaya kampus tidak mendukung	Kesenjangan antara kesadaran dan praktik	Ambivalensi antara pengetahuan Qur'ani dan perilaku ekologis
Banjir, longsor, kebersihan kampus, organisasi mahasiswa, kajian keagamaan	Konteks lokal dan institusional	Kampus dan Kota Palopo sebagai ruang pembentukan kesadaran ekologis

Based on the author's analysis, this pattern shows that Qur'anic Ecological Literacy works as an interpretive mechanism that bridges religious texts and ecological action. Students do not merely know that Islam prohibits environmental destruction, but also interpret such destruction through concrete experiences, such as floods, waste, consumptive behavior, and weak institutional support. This finding expands the concept of environmental literacy, which generally emphasizes knowledge, attitudes, concern, and action, because in the context of Muslim students there is an additional layer in the form of theological and spiritual meaning-making regarding the environment (Örs, 2022).

4.2. The Environment as a Divine Trust

The first theme shows that Muslim students interpret the environment as a divine trust. Participant perspectives indicate that nature is not understood as a neutral material object, but as Allah's creation that must be protected as part of religious responsibility. One participant stated, "I understand the environment as a trust from Allah. So if we damage the environment, we are actually not only harming humans, but also failing to protect what Allah has entrusted to us" (P4, in-depth interview). Another statement emphasized, "If humans are called khalifah, it means that humans are not the absolute owners of nature. We are only given the task of managing it. So, in my view, protecting the environment is part of responsibility as a Muslim" (P9, in-depth interview).

Interpretative findings reveal that the concepts of amanah and khalifah shape students' ecological awareness through the vertical relationship between humans and God and the horizontal relationship between humans and nature. Within the framework of Islamic environmental ethics, humans are not positioned as absolute owners of natural resources, but as moral subjects responsible for maintaining the balance of creation. The author's analysis shows that the meaning of "amanah" has a strong ethical function because it is able to transform environmental issues from merely matters of cleanliness into matters of spiritual responsibility. Thus, protecting the environment is not only seen as good social behavior, but as part of ecological piety.

This finding strengthens the results of Begum et al. (2021), which show that Islamic religiosity can strengthen the relationship between environmental moral education and students' pro-environmental behavior (Begum et al., 2021). However, this study provides a more interpretative contribution because it does not treat religiosity as a statistical moderator variable, but as a moral language used by students to understand the meaning of the environment. In other words, religiosity in this study functions not only as a predictor of behavior, but as a structure of meaning that shapes how students interpret the relationship between humans and nature.

4.3. Fasad as an Ecological and Spiritual Crisis

The second theme shows that students interpret *fasad* as ecological destruction as well as a spiritual crisis. One participant stated, "In my view, *fasad* is not only war or major destruction. Throwing garbage carelessly, cutting down trees without thinking about the consequences, is also included as *fasad* because it makes nature

unbalanced” (P12, in-depth interview). In the FGD, another participant linked fasad to local disasters: “If floods keep happening, we cannot simply say that they are natural disasters. Human behavior is also involved, such as waste, poorly maintained drainage, and lack of awareness. In religious language, this can be called a consequence of fasad” (FGD 1).

These qualitative insights show that the concept of fasad undergoes an expansion of meaning in students’ consciousness. Fasad is not only understood as an abstract theological or moral category, but as a lens for reading contemporary ecological problems such as waste, floods, pollution, and environmental imbalance. The author’s analysis emphasizes that this meaning-making is important because it shows the process of actualizing Qur’anic concepts into local reality. Students do not separate verses, experience, and social context; instead, they read the ecological experiences of Palopo City through the moral language of the Qur’an.

This finding has similarities with Zafar and Abu-Hussin (2025), who show that religiosity can be positively related to environmental protection orientation in the context of Muslim society (Zafar & Abu-Hussin, 2025). However, this study differs because it explains how such religious meaning is constructed in students’ lived experiences, not merely showing a statistical relationship between religiosity and environmental behavior. Thus, this study shows that fasad functions as a phenomenological category that enables students to understand environmental destruction as an ecological, moral, and spiritual event at once.

4.4. Ishlah as an Act of Ecological Restoration

The third theme shows that ishlah is interpreted as an act of ecological restoration that can be carried out through simple and everyday practices. One participant stated, “If fasad means destroying, then ishlah means repairing. For me, participating in communal work, reducing plastic waste, or maintaining campus cleanliness can be a small form of ishlah that students can do” (P17, in-depth interview). This quotation shows that students do not always imagine ecological action on a large scale, but interpret it through micro practices such as disposing of waste properly, reducing plastic, saving water, saving electricity, and participating in cleaning activities.

Emerging themes suggest that ishlah becomes a transformative concept because it connects moral awareness with practical action. The author’s analysis shows that the strength of the concept of ishlah lies in its ability to transform ecological responsibility into actions that are close to students’ lives. However, the observation results also show that the practice of ishlah has not yet fully stabilized as a collective habit. Some students showed concern for the cleanliness of classrooms and campus yards, but the use of single-use plastics was still quite common. Thus, ishlah has emerged as awareness, but has not yet fully become a consistent ecological culture.

This finding is in line with Suárez-Perales et al. (2021), who found that environmental education in higher education influences pro-environmental behavior indirectly through knowledge, concern, and willingness to act (Suárez-Perales et al., 2021). However, this study adds that in the context of Muslim students, the process toward action does not only occur through knowledge and concern, but also through religious meaning-making regarding acts of restoration. This finding also strengthens Saulick et al. (2024), who showed that positive attitudes toward the environment do not always turn into active pro-environmental behavior (Saulick et al., 2024).

4.5. Ambivalence between Qur’anic Knowledge and Ecological Practice

The fourth theme shows the existence of ambivalence between students’ Qur’anic knowledge and ecological practice. One participant stated, “I know that Islam prohibits damaging the environment, but sometimes in practice I am still negligent. For example, I still use single-use plastics, and sometimes I also do not pay much attention to waste when trash bin facilities are lacking” (P21, in-depth interview). Another participant added, “If the campus provides segregated trash bins and has regular movements, perhaps students would become more accustomed to it. But if it is only an appeal, it usually does not last long” (P26, in-depth interview).

Interpretative analysis shows that this ambivalence is not merely a matter of low religious knowledge or weak individual awareness. On the contrary, ambivalence emerges because students’ ecological awareness exists within a complex social field, including limited campus facilities, a culture of plastic consumption, weak collective habits, and the insufficient integration of environmental issues into campus religious studies. The

author's analysis emphasizes that the gap between knowledge and practice is a critical point in Islamic environmental education. Students may have normative awareness, but such awareness requires institutional support in order to turn into collective behavior.

This finding critiques the Knowledge-Attitude-Practice model, which tends to view the relationship between knowledge, attitudes, and behavior linearly. Wang and Zhang (2021) explain that environmental knowledge is an important factor in shaping students' pro-environmental attitudes and behavior (Wang & Zhang, 2021). However, the results of this study show that Qur'anic knowledge does not automatically produce ecological behavior if it is not supported by social context, facilities, and campus culture. Thus, this study expands the KAP model through a phenomenological perspective: knowledge must be mediated by meaning, experience, habits, and institutional support before becoming consistent ecological practice.

4.6. Campus and Palopo City as Spaces for the Formation of Ecological Awareness

The fifth theme shows that Palopo City and the campus environment play a role as spaces for the formation of Muslim students' ecological awareness. One participant stated, "I began to become aware when I saw floods in several areas of Palopo. From there, I felt that environmental issues were not something distant. They are close to our lives" (P3, in-depth interview). In the FGD, another participant stated, "Islamic studies on campus often discuss morals, worship, or social issues, but they still rarely discuss the environment. In my view, however, the environment is also part of Islamic ethics" (FGD 2).

The contextual meaning of this finding shows that local experience has a pedagogical function in shaping ecological awareness. Floods, landslides, waste, and environmental degradation make ecological issues close and personal for students. From a phenomenological perspective, these experiences shape the way students understand themselves as Muslims, as students, and as part of the local community. The author's analysis shows that Palopo City is not only the location of the study, but also a space of experience that mediates the relationship between Qur'anic texts and students' ecological awareness.

The campus context also plays an important role in strengthening or weakening the internalization of ecological values. Students need segregated trash bins, regular environmental programs, Islamic studies with ecological themes, lecturer role models, and green campus policies so that pro-environmental awareness can become a collective practice. This finding is consistent with Ullah et al. (2024), who showed that green campus initiatives, institutional ecosystems, and institutional support systems contribute to the formation of students' green intention and green behavior (Ullah et al., 2024). However, this study adds that among Muslim students, institutional support will be more effective when integrated with Qur'anic values, rather than merely packaged as administrative policy or general environmental campaigns.

4.7. Synthesis of Findings and Theoretical Contribution

Therefore, the results of the study show that Qur'anic Ecological Literacy among Muslim students in Palopo City is formed through three layers of experience. First, the cognitive-religious layer, namely understanding of the concepts of *fasad*, *ishlah*, *khalifah*, *amanah*, and *mizan*. Second, the reflective-moral layer, namely the awareness that protecting the environment is part of responsibility as a Muslim. Third, the practical-contextual layer, namely the effort to translate Qur'anic values into everyday actions, although it is still influenced by campus facilities, consumptive culture, social habits, and local ecological experiences.

The theoretical contribution of this study is to offer the concept of Qur'anic Ecological Literacy as a bridge between Islamic environmental ethics, ecological literacy, and the phenomenology of students' experience. This concept explains that Muslim students' pro-environmental awareness does not only require ecological knowledge, but also requires religious meaning-making that makes environmental issues part of the responsibility of faith. This finding also addresses the gap identified by Husamah et al. (2025), that studies on Islam and sustainability still require stronger integration between Islamic theological concepts and empirical environmental practices (Husamah et al., 2025).

The practical contribution of this study lies in the recommendation that Qur'an-based environmental education in higher education needs to be designed in an applied, reflective, and contextual manner. Such education is

not sufficient merely by including environmental verses in course materials, but needs to connect texts, local experiences, ethical reflection, and concrete ecological practices. Thus, the campus can become a space for ecological transformation if it is able to integrate Islamic Religious Education, religious studies, student organizations, green campus policies, and environmental facilities that support pro-environmental habituation.

5. CONCLUSION

Based on the research findings, it can be concluded that Muslim students do not understand Qur'anic ecological concepts merely as normative teachings, but as a framework of meaning that helps them interpret the relationship between humans, God, and nature. The concepts of khalifah and amanah shape the awareness that humans are not absolute owners of nature, but stewards who have moral and spiritual responsibility to maintain the balance of creation. Thus, Qur'anic ecological literacy in this study functions as a bridge between religious texts and students' ecological awareness.

The research findings also show that the concept of fasad is understood by students as ecological destruction as well as a moral crisis of humans. Students connect fasad with concrete problems such as waste, floods, pollution, human negligence, and weak awareness of protecting the environment. Conversely, ishlah is interpreted as an act of ecological restoration that can be realized through simple practices, such as reducing plastic use, maintaining campus cleanliness, saving water, saving electricity, and participating in environmental activities. However, this study found ambivalence between Qur'anic knowledge and ecological practice. Students understand that Islam teaches responsibility toward the environment, but pro-environmental practices are not yet fully consistent because they are influenced by campus facilities, consumptive culture, social habits, and weak institutional habituation.

Therefore, this study emphasizes that Muslim students' pro-environmental awareness is formed through three layers of experience: first, the cognitive-religious layer in the form of understanding Qur'anic ecological concepts; second, the reflective-moral layer in the form of awareness that protecting the environment is part of responsibility as a Muslim; and third, the practical-contextual layer in the form of efforts to translate Qur'anic values into everyday actions. Thus, the main contribution of this study is to expand the study of ecological literacy from a cognitive-secular framework toward an ethical-spiritual framework based on the Qur'an. This study also strengthens the position that Islamic environmental education is not sufficient to be delivered normatively, but must be developed reflectively, contextually, and applicatively in campus and community life.

6. RECOMMENDATIONS AND POLICY IMPLICATIONS

Based on the research findings, higher education institutions in Palopo City need to develop a Qur'an-based environmental education model that is integrated into the curriculum, student activities, and campus policies. Islamic Religious Education materials, thematic interpretation, ethics, and contemporary Islamic studies can include ecological issues as part of discussions on fasad, ishlah, khalifah, amanah, and mizan. This integration is important so that students do not only understand the environment as a technical issue, but also as part of the responsibility of faith, social ethics, and the sustainability of life. In this context, lecturers and study program managers need to design learning that connects Qur'anic texts, moral reflection, and local ecological experiences.

Institutionally, campuses need to develop green campus policies that are not merely symbolic, but encourage real ecological behavioral change. Such policies can include the provision of segregated trash bins, reduction of single-use plastics, energy-saving programs, regular cleanliness movements, campus greening, and the involvement of student organizations in sustainability programs. The research findings show that religious knowledge does not automatically turn into ecological practice if it is not supported by an adequate institutional system. Therefore, campuses need to create an ecosystem that enables Qur'anic values regarding the environment to become collective habits.

Policy implications are also directed toward the local government and religious institutions in Palopo City. The local government can collaborate with higher education institutions, mosques, student organizations, and environmental communities to develop ecological literacy programs based on religious values. Sermons, Friday sermons, Islamic studies, and socio-religious activities can be directed toward strengthening public awareness

that environmental issues are not only technical problems, but also moral and spiritual problems. Thus, local environmental policies will be more effective if they integrate scientific approaches, education, local culture, and religious values that live within society.

Practically, the results of this study recommend that Qur'an-based environmental education be developed through a participatory approach. Students need to be involved not only as recipients of material, but also as agents of ecological change in the campus environment and society. Programs such as eco-da'wah, student communities concerned with the environment, green Muslim lifestyle campaigns, and environment-based community service projects can become concrete strategies for connecting Qur'anic literacy with sustainability practices. In this way, Qur'anic Ecological Literacy can move from the level of knowledge toward the formation of ecological character and sustainable social action.

7. LIMITATIONS AND FUTURE RESEARCH

This study has several limitations. First, this study uses a phenomenological approach with 30 Muslim student participants in Palopo City, so the findings produced are contextual and are not intended for statistical generalization. The strength of this study lies in the depth of understanding of participants' experiences and subjective meanings, but its geographical and social scope is still limited to a particular local context. Therefore, the results of the study need to be read as a phenomenological understanding of the experiences of Muslim students in Palopo, not as a representation of all Muslim students in Indonesia.

Second, this study focuses on Muslim students as the main participants, so it has not compared the ecological experiences of other groups, such as lecturers, campus administrators, religious leaders, environmental communities, or students from different religious backgrounds. In fact, the formation of ecological awareness on campus is also influenced by institutional policies, the role of lecturers, the culture of student organizations, and broader social support. Future research can expand the participants in order to obtain a more comprehensive picture of the ecosystem of environmental education based on religious values.

Third, this study uses a qualitative approach, so it has not measured the level of relationship between Qur'anic ecological literacy and pro-environmental behavior quantitatively. Future research can develop a measurement instrument for Qur'anic Ecological Literacy based on the concepts of *fasad*, *ishlah*, *khalifah*, *amanah*, and *mizan*, then test it through quantitative surveys or mixed-method research. This approach can help examine whether Qur'anic ecological literacy influences students' pro-environmental attitudes, intentions, and behavior on a broader scale.

Fourth, future research can also conduct comparative studies across regions, for example between students in small cities, large cities, Islamic higher education institutions, general higher education institutions, student *pesantren*, and campus da'wah communities. Longitudinal studies are also important to see whether Qur'an-based environmental education interventions are truly able to shape ecological behavioral change in the long term. In addition, experimental research or action research can be conducted to test the effectiveness of programs such as eco-khutbah, ecology-based Islamic Religious Education curricula, green campus movements, or Qur'anic ecological literacy training in increasing students' pro-environmental awareness and practices.

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