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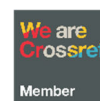
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# Implementing qur'anic environmental education values through a community-based household waste management program

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## ABSTRACT

This study addresses the growing problem of household waste in Pematang Regency, Indonesia, where waste management practices remain largely technical and insufficiently value-oriented. Drawing on Qur'anic teachings that emphasize human responsibility as khalifah (stewards of the earth), this study aims to examine the implementation of Qur'an-based environmental education through a community-based household waste management mentoring program. Using a qualitative approach with the Participatory Action Research (PAR) method, the study involved 100 community members, six facilitators, and local religious and community leaders. Data were collected through participant observation, in-depth interviews, documentation, and semi-structured questionnaires as supporting instruments. Data analysis followed the interactive model of Miles and Huberman, supported by triangulation to ensure credibility. The findings indicate that the internalization of Qur'anic values such as khalifah, amanah, mizan, and the prohibition of fasad contributed to increased ecological awareness and behavioral change in household waste management practices, including waste segregation, reduction, and recycling. The mentoring process also fostered collective participation and strengthened community-based ecological responsibility. This study concludes that Qur'an-based environmental education implemented through a participatory mentoring approach can effectively promote sustainable household waste management while reinforcing the integration of Islamic spiritual values into community-driven environmental practices.



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## Introduction

Household waste management remains one of the most pressing environmental challenges in Indonesia. According to data from the National Waste Management Information System (SIPSN), Indonesia generates more than 68 million tons of waste annually, with household waste constituting

the largest proportion. Pematang Regency, a region experiencing steady population growth, faces similar challenges, including increasing waste volume and limited community participation in sustainable waste management practices. These conditions not only undermine environmental cleanliness but also pose serious risks to public health and the quality of local ecosystems (Sukoco et al., 2024; Riani & Fatoni, 2024; Omar et al., 2018).

Conceptually, environmental education is widely recognized as a strategic instrument for fostering ecological awareness and responsible environmental behavior. Through educational processes, individuals and communities can internalize values, knowledge, and skills that support environmentally responsible actions. In Muslim societies, these principles resonate strongly with Qur'anic teachings that emphasize human responsibility as *khalifah fil ardh* (stewards of the earth) and prohibit environmental destruction (*fasad fil ardh*) (Neuwirth, 2025; Muhammad et al., 2024; Fikri & Colombijn, 2021). These Qur'anic principles align closely with the concepts of stewardship and sustainability in contemporary environmental education discourse.

A growing body of research demonstrates that integrating Islamic values into environmental education has significant potential to promote sustainable behavior. Principles such as *khalifah*, *mizan* (balance), and *israf* (avoidance of excess) have been employed as foundational elements in environmental education programs within Islamic institutions, particularly pesantren, yielding positive outcomes in terms of ecological awareness and environmental practices (Asshidiqi & Sholihah, 2024; Kasanah et al., 2023; Pramono et al., 2022). Similar findings are reported in studies on Qur'an-based ecopedagogy, which emphasize participatory learning through activities such as waste management, environmental conservation, and ecological skill development (Maslani et al., 2023; Nugroho & Anam, 2023; Nurani et al., 2022).

Religious-based environmental initiatives have also proven effective at the community level. Previous studies indicate that religious activities accompanied by environmental guidance contribute to more ethical waste management behavior among community members (Eriza & Supratikta, 2024; Harahap & Muslimin, 2018). This normative foundation is further reinforced by the issuance of the Indonesian Council of Ulama (MUI) Fatwa No. 41 of 2014 on Waste Management for Environmental Protection, which frames environmental cleanliness and pollution prevention as religious obligations (Iskandar & Sofuoğlu, 2025; Omar et al., 2018; Riani & Fatoni, 2024).

Despite the growing literature on Islamic environmental ethics and education, most existing studies focus on formal educational settings such as pesantren and universities (eco-pesantren and green campus initiatives). Empirical research examining the implementation of Qur'anic environmental values in community-based mentoring programs, particularly at the household level, remains limited (La Fua et al., 2018; Widodo, 2024; Nurani et al., 2022). At the same time, previous studies suggest that the limited effectiveness of waste management programs is often rooted in low community participation and environmental awareness rather than infrastructural constraints (Nugroho et al., 2023; Arbi, 2014; Faghfirlia et al., 2023). These findings suggest that Islamic value-based environmental education approaches have strong potential to be extended beyond formal institutional settings and applied within non-institutional contexts, particularly at the household and community levels.

Addressing this research gap, a mentoring approach grounded in Qur'anic values and implemented through Participatory Action Research (PAR) offers a promising framework. PAR enables the dialogical internalization of spiritual, moral, and social values while positioning community members as active agents of change. This approach is also consistent with Islamic eco-theology, which emphasizes moral responsibility in environmental preservation and climate change mitigation (Mustofa & Zenrif, 2025; Muhammad et al., 2024; Fikri & Colombijn, 2021).

Accordingly, this study aims to: (1) describe environmental education values embedded in Qur'anic verses; (2) examine the structure and mechanisms of a household waste management mentoring program in Pematang Regency; (3) analyze the implementation of Qur'anic values within community mentoring activities; and (4) assess changes in community knowledge, attitudes, and behaviors related to household waste management. This study is expected to contribute theoretically

to the development of Islamic environmental education grounded in community practice and practically to the design of replicable, faith-based community empowerment models for sustainable environmental management. Therefore, this study employs a Participatory Action Research (PAR) approach, which enables the integration of Qur'anic values into processes of social change through participatory and reflective community engagement.

## Method

This study employed a qualitative approach using the Participatory Action Research (PAR) method. PAR was selected because it emphasizes the active involvement of community members throughout the research process, including problem identification, action planning, implementation, observation, and collective reflection. Within this framework, community members were not positioned as research objects but as subjects who actively participated in and contributed to processes of social and environmental change. The PAR approach is particularly appropriate for exploring social and spiritual dynamics rooted in Qur'anic values, especially in the context of community-based environmental education (Khafsoh & Riani, 2024; Soedarwo et al., 2022; Corsita et al., 2024).

The research was conducted through several PAR cycles consisting of planning, action, observation, and reflection stages. During the planning stage, researchers, facilitators, and community members collaboratively identified household waste management problems and formulated mentoring strategies based on Qur'anic environmental values. The action stage involved the implementation of mentoring activities, environmental education sessions, and practical household waste management practices. Observation was carried out to document community participation, social interactions, and emerging changes in ecological behavior. The reflection stage was conducted participatorily to evaluate the effectiveness of the activities and to refine strategies for subsequent cycles.

The data consisted of primary and secondary sources. Primary data were obtained through participant observation during mentoring activities, in-depth interviews with community members, program facilitators, and local religious and community leaders, as well as visual documentation of waste management practices in the field. Secondary data included Qur'anic verses related to environmental education values, scholarly literature on Islamic environmental education, and policy documents on waste management in Pematang Regency. Source triangulation was applied to enhance the credibility of field findings, as commonly practiced in community-based qualitative research (Mubarak et al., 2024; Naria et al., 2021; Mulasari et al., 2024).

Research participants comprised 100 community members in the mentoring locations, six program facilitators, and local religious and community leaders. Participants were selected using purposive sampling based on their direct involvement in household waste management activities and Qur'an-based environmental education programs. This technique was employed to ensure that participants possessed relevant experiences and in-depth perspectives on the social changes occurring throughout the mentoring process (Soedarwo et al., 2022; Khafsoh & Riani, 2024; Sriseptayana & Kuswanda, 2025).

Data collection employed four primary techniques. First, participant observation was conducted throughout the mentoring process to capture social interactions, participation patterns, and learning dynamics in household waste management practices. Second, in-depth interviews were carried out with community members, facilitators, and religious leaders to explore perceptions, experiences, and interpretations of Qur'anic values and ecological behavior. Third, semi-structured questionnaires were used as supporting instruments to document changes in community knowledge, attitudes, and behaviors related to environmental management. Fourth, documentation included photographs, field notes, and participants' reflective records illustrating the internalization of Qur'anic values in everyday practices. These techniques followed participatory research practices commonly applied in community-based environmental studies in Indonesia (Naria et al., 2021; Khafsoh & Riani, 2024; Mubarak et al., 2024).

Data analysis was conducted using the interactive model proposed by Miles and Huberman, which consists of three interrelated stages: data reduction, data display, and conclusion drawing and verification. Data reduction involved selecting, focusing, and simplifying raw data to retain information relevant to the research objectives. Data display was organized in the form of descriptive narratives, matrices, and tables to facilitate interpretation. Conclusion drawing and verification were conducted iteratively by linking empirical findings with the theoretical framework employed (Creswell, 2015; Miles & Huberman, 1984). This analytical model was chosen for its capacity to capture the complexity of social processes in participatory community research and has been widely applied in environmental and participatory education studies in Indonesia (Tidja et al., 2025; Anisykurilillah et al., 2024; Normalin et al., 2021).

To ensure the credibility and trustworthiness of the findings, methodological and source triangulation were applied by comparing data derived from observations, interviews, questionnaires, and documentation. In addition, periodic collective reflection with participants was conducted to minimize interpretive bias and enhance transparency. This approach is consistent with validity principles in participatory qualitative research, which emphasize reflexive engagement, transparency of the research process, and the authenticity of participants' perspectives (Kurniawati et al., 2025; Michmidatin & Rodiyah, 2024; Marais et al., 2019).

## Results and Discussions

This section presents the research findings derived from a qualitative analysis of interview data, observations, documentation, and supporting questionnaires collected throughout the mentoring process. The findings are organized into three main aspects: (1) the process of internalizing Qur'anic environmental education values within the community, (2) the implementation of these values through participatory mentoring practices, and (3) the resulting changes in ecological awareness and household waste management behavior.

**Table 1.** Environmental Education Values in Qur'anic Verses

Qur'anic Verse	Core Environmental Education Value
Qur'an, Al-Baqarah [2]:30 <i>Remember when your Lord said to the angels: Indeed, I will place a vicegerent (khalifah) upon the earth.</i>	Ecological responsibility: Humans are entrusted with the duty to protect and manage the environment in a just and sustainable manner.
Qur'an, Al-A'raf [7]:56 <i>And do not cause corruption upon the earth after it has been set in order, and invoke Him in fear and hope.</i>	Prohibition of exploitation: An injunction to maintain ecological balance and avoid environmental degradation and pollution.
Qur'an, Ar-Rahman [55]:7-8 <i>And the heaven He raised and established the balance, so that you do not transgress within the balance.</i>	Ecological balance: Maintaining harmony and avoiding excess in the use of natural resources.
Qur'an, Al-A'raf [7]:31 <i>Eat and drink, but do not be excessive. Indeed, He does not like those who commit excess.</i>	Sustainable lifestyle: Self-restraint in consumption patterns and waste generation.
Qur'an, Ibrahim [14]:7 <i>If you are grateful, I will surely increase you [in favor]; but if you deny, indeed, My punishment is severe.</i>	Ecological gratitude: Spiritual responsibility to care for nature as an expression of gratitude to God.
Qur'an, Al-An'am [6]:165 <i>It is He who has made you successors upon the earth and raised some of you above others in degrees, that He may test you in what He has given you.</i>	Socio-environmental ethical responsibility: Utilizing natural resources proportionally, justly, and responsibly.
Qur'an, Ar-Rum [30]:41 <i>Corruption has appeared on land and sea because of what people's hands have earned</i>	Ecological awareness: Humans must transform their behavior to restore environmental balance and address ecological degradation.

Analysis of the interview data indicates that Qur'anic values served as a strong foundation for fostering environmental awareness among community members in Pemalang. Informant A stated that prior to the mentoring program, they "used to dispose of all waste together," but after receiving explanations of Qur'anic verses prohibiting environmental destruction, they began separating organic and inorganic waste. Similarly, Informant B explained that they had come to realize environmental care as part of religious devotion, which led them to reduce plastic use and bring reusable shopping bags.

The values of *khalifah fil ardh* and the prohibition of *fasad fil ardh* introduced during the mentoring activities emerged as effective entry points for motivating behavioral change. As expressed by Informant C, a local Qur'anic education teacher (TPQ), "community members are more receptive to messages about cleanliness when they are conveyed through Qur'anic teachings." These findings reinforce the theoretical perspective of Islamic environmental education, which positions humans as stewards of the earth (stewards of nature) responsible for maintaining ecological balance (Rahmat et al., 2022).

Table 1 illustrates that the Qur'anic verses employed in the mentoring program served both educational and transformational functions. These verses were used as foundational references for guidance materials, environmental sermons, and community outreach modules. This verse-based approach was not merely theological in nature but also contextual, fostering a sense of accountability toward the environment as a divine trust.

In practice, facilitators conveyed these values through thematic lectures and practical simulations of household waste management. For instance, the value of *mizan* was linked to waste segregation practices aimed at preventing soil and water contamination, while the principle of *israf* was translated into everyday habits such as using reusable containers during shopping activities. Findings from observations and interviews indicate that this Qur'an-based approach was more readily accepted by community members than purely technical approaches, as it carried strong moral and spiritual legitimacy.

This faith-based approach grounded in Qur'anic teachings also reinforces previous research demonstrating that Islamic teachings can function as an ecological foundation for shaping sustainable behavior. As reported by Rahmat et al. (2022), the integration of religious values into environmental education has the potential to strengthen the moral agency of communities in environmental stewardship.

The implementation of the program is carried out through a reflective cycle in accordance with the principles of Participatory Action Research (PAR), involving the community from the planning stage through to the evaluation.



**Figure 1** The Four Stages of Participatory Action Research (PAR) in Household Waste Management Mentoring in Pemalang Regency

The assessment of changes in community knowledge, attitudes, and behaviors was conducted using a qualitative-descriptive approach through the synthesis of semi-structured questionnaires, field observations, in-depth interviews, and documentation. Consequently, the percentages presented function as participatory indicators to illustrate trends in change rather than as statistical generalizations.

**Table 2.** The Four Stages of Participatory Action Research (PAR) in Household Waste Management Mentoring in Pematang Rejang Regency

PAR Stage	Description of Field Activities	Main Outcomes / Field Findings	Emphasized Qur'anic Values
Diagnosis (Problem and Value Identification)	Facilitators and community members collaboratively conducted household waste problem mapping, focus group discussions (FGDs) on waste disposal practices, and identification of relevant Islamic values.	It was found that approximately 70% of residents had not practiced waste segregation, and most household waste was burned. Community members recognized Qur'anic verses such as Al-A'raf [7]:56 and Ar-Rum [30]:41 as moral foundations for environmental cleanliness and protection.	Prohibition of environmental destruction (fasad fil ardh) and responsibility as khalifah fil ardh (ecological stewardship).
Action Planning (Program Design and Education)	Community members were organized into three groups: religious education, technical training, and environmental monitoring. Religious leaders prepared sermon and study materials themed "Cleanliness as Part of Faith and Ecological Stewardship."	Community members demonstrated growing enthusiasm during discussions and collectively agreed to establish a Qur'anic Waste Bank as a shared initiative.	Gratitude for environmental blessings (shukr) (Qur'an, Ibrahim [14]:7) and ecological balance (mizan) (Qur'an, Ar-Rahman [55]:7-8).
Action Implementation (Mentoring Activities)	Training sessions were conducted on waste segregation, compost production, and the reuse of plastic waste into recycled products. Religious leaders linked these practices to Islamic teachings through Friday sermons and majlis ta'lim.	Community participation increased to approximately 80%. Local initiatives emerged, such as No-Waste Day and the Clean Home Amanah Movement.	Simplicity and avoidance of excess (anti-israf) (Qur'an, Al-A'raf [7]:31) and ecological justice (mizan).
Reflection (Evaluation and Social Learning)	Community members, facilitators, and religious leaders engaged in collective reflection on behavioral changes and program effectiveness. Each reflection cycle resulted in adjustments to religious messaging strategies and waste management techniques.	The community demonstrated increased ecological awareness and perceived waste management as part of religious practice. The program was considered successful as participation remained high even when direct facilitation was gradually reduced.	Gratitude (shukr) and moral responsibility toward the earth as khalifah.

The findings on the Table 2 indicate that the household waste management mentoring program in Pematang ReGENCY was implemented through a Participatory Action Research (PAR) cycle encompassing problem diagnosis, action planning, activity implementation, and participatory reflection grounded in Qur'anic values.

The table above illustrates that the PAR process in this study unfolded in a dynamic and collaborative manner. Each stage was oriented not only toward technical outcomes but also toward the internalization of Qur'anic values as the foundation for behavioral change. The diagnosis and reflection stages played a crucial role in fostering critical environmental awareness among community members, while the planning and implementation stages contributed to the development of sustainable ecological skills. Accordingly, this value-based PAR approach demonstrates potential effectiveness in encouraging shifts in community mindsets and practices, from passive recipients of environmental education to empowered agents of social and environmental change.

**Table 3.** Impacts of the Mentoring Program on Community Knowledge, Attitudes, and Behavior

Aspect	Measurement Indicators	Condition Before Mentoring	Condition After Mentoring
Knowledge (Cognitive)	Community understanding of Qur'anic environmental values (khalifah, mizan, israf).	Most residents (approximately 25%) were aware of Islamic teachings on cleanliness but had not yet connected them to ecological responsibility.	More than 85% of residents understood that environmental protection is part of religious devotion and a trust (amanah) as khalifah fil ardh.
Attitudes (Affective)	Spiritual motivation and moral responsibility toward the environment.	Attitudes toward cleanliness were largely pragmatic, driven by social obligations or village regulations.	A new awareness emerged that cleanliness represents an expression of faith (thaharah jasadiyah wa ma' nawiyah).
Behavior (Conative)	Concrete household waste management practices (sorting, processing, and reduction).	Concrete household waste management practices (sorting, processing, and reduction) were limited and inconsistently applied.	81% of residents routinely practiced waste segregation; 60% used household composters; three units of <i>Qur'anic Waste Banks</i> were established.
Collective Concern (Socio-Spiritual)	Participation in community deliberations, collective work, and reflection activities.	Participation was low, and activities were largely ceremonial with limited continuity.	Residents actively participated in deliberations, collective work, and monthly reflections led by religious leaders.
Sustainability (Reflective)	Community willingness to maintain practices after the program concluded.	High dependence on facilitators and minimal follow-up initiatives.	72% of residents expressed readiness to continue activities independently through self-funded initiatives.

The results presented in Table 3 indicate that the Qur'an-based approach not only enhanced community members' rational understanding of the importance of waste management but also transformed their spiritual and social consciousness. The affective dimension emerged as a key driver of change: cleanliness was no longer perceived merely as a technical activity, but rather as an expression of religious devotion and moral responsibility toward God's creation.

Improvements in ecological behavior also had positive implications for social relations within the community. Practices such as collective work, shared reflection, and the active involvement of religious leaders contributed to the sustainability of the mentoring activities. Accordingly, these

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findings reinforce the view that Qur'an-based community empowerment implemented through PAR can cultivate ecological citizenship rooted in faith and collective awareness.

The Qur'an-based household waste management mentoring program in Pematang Rejang Regency demonstrated positive social dynamics over the medium term. Activities that were initially driven by external facilitators gradually became community-initiated through the formation of the Hijau Barokah group and the Qur'anic Waste Bank. These groups functioned not only as waste collection mechanisms but also as platforms for environmental *da'wah* that integrate spiritual values with everyday ecological practices. This shift reflects a transition from viewing the community as an object of intervention to positioning it as a subject of social change, in line with the core principles of Participatory Action Research (PAR) (Sukoco et al., 2024; Burhanuddin, 2024; Pratama et al., 2021).

Interview findings further reveal that community members experienced increased empowerment and a heightened sense of collective responsibility for environmental cleanliness. As one religious leader stated, "after this program, residents clean their environment not because they are instructed to do so, but because they perceive it as part of their faith." Such spiritual awareness strengthens social capital and ecological solidarity among community members. These findings corroborate previous studies indicating that the success of environmental management programs is strongly influenced by levels of empowerment and local leadership grounded in cultural and religious values (Mulasari et al., 2024; Chairunissa et al., 2023; Darsono et al., 2023).

From an institutional perspective, the Qur'anic Waste Bank established during the mentoring process represents a participatory model that integrates economic, social, and spiritual dimensions. Each waste transaction is accompanied by reflective sessions emphasizing Qur'anic values such as gratitude (*shukr*), responsibility as *khalifah*, and ecological justice. This integrative approach reinforces theoretical arguments that faith-based empowerment can foster long-term socio-ecological sustainability, as highlighted in studies on *waqf*-based waste management in Indonesia (Riani & Fatoni, 2024; Fariz et al., 2024; Nyoman et al., 2024).

Moreover, program sustainability was strongly influenced by institutional support and effective environmental communication. Village governments, religious leaders, and local youth played synergistic roles in ensuring continuity even after the formal mentoring phase had concluded. This cross-sector collaboration reflects an inclusive, community-based model of environmental governance. Similar patterns have been observed in Yogyakarta and Surakarta, where effective waste governance depends on the integration of community actors, government institutions, and religious organizations (Nugroho et al., 2023; Salsabila et al., 2023; Agustang et al., 2023).

Based on field findings, the sustainability of the Pematang Rejang program can be understood through three interrelated dimensions: (1) the establishment of stable social institutions, reflected in organized groups and forums with clear structures and regular activities; (2) ecological spirituality, marked by increased religious awareness that motivates behavioral change; and (3) cross-sector support that ensures resource continuity and social legitimacy. This approach aligns with theories of community-driven waste management and sustainable empowerment developed in the Southeast Asian context, where religion and local wisdom function as key instruments for strengthening community participation (Zahra & Shohibuddin, 2025; Prawira & Rahayu, 2024; Brotosusilo et al., 2021).

Overall, this section demonstrates that sustainability in the Pematang Rejang program extends beyond technical aspects of waste management to encompass social and spiritual sustainability rooted in the internalization of Qur'anic values and community collaboration. This empowerment model illustrates the effectiveness of a faith-based participatory action approach, in which religious teachings serve not only as sources of inspiration but also as social mechanisms that bind communities in the practice of sustainable environmental management.

## Conclusions

This study demonstrates that environmental education values embedded in Qur'anic verses, such as khalifah, mizan, israf, and the prohibition of fasad fil ardh, can be contextually implemented through community-based household waste management mentoring programs. These values function not only as religious normative principles but also as ethical frameworks that foster ecological awareness and a sense of environmental responsibility among community members. Through the Participatory Action Research (PAR) approach, the mentoring program in Pematang ReGENCY was implemented in a participatory manner across the stages of problem diagnosis, action planning, implementation, and collective reflection. This approach facilitated the internalization of Qur'anic values into everyday household waste management practices and strengthened the role of community members as active subjects of social and environmental change. The findings indicate observable changes in community knowledge, attitudes, and behaviors related to household waste management. Waste management is no longer perceived merely as a technical activity, but as an expression of moral responsibility and religious practice. These changes were supported by increased collective participation, the active involvement of religious leaders, and the establishment of local institutions, such as the Qur'anic Waste Bank and the Hijau Barokah group, which contributed to the sustainability of the program.

From a theoretical perspective, this study contributes to the field of Islamic environmental education by demonstrating that the integration of Qur'anic values with participatory approaches can cultivate ecological citizenship rooted in spiritual and social consciousness. Practically, the study offers a replicable model of faith-based, community-driven household waste management mentoring that may be adapted for other Muslim communities as a strategy for sustainable ecological empowerment. Future research is recommended to examine the application of similar models in diverse regional and socio-cultural contexts, as well as to integrate qualitative approaches with quantitative methods in order to assess the long-term impacts on environmental sustainability and community-based waste governance.

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