
From Green Programs to Green Souls: Cultivating Environmental Character Through School-Based Ecological Interventions

Muhamad Abdul Gofur¹

Email: abdul.gofur@staibanisaleh.ac.id; opng38@gmail.com

Pepi Andraini²

Email: pepianggraini@staibanisaleh.ac.id

Ilham Jaya³

Email: ilham@ubs.ac.id

^{1/3} Pendidikan Guru Madrasah Ibtidaiyah (PGMI)
STAI Bani Saleh Kota Bekasi

³ Pendidikan Guru Sekolah Dasar (PGSD)
Universitas Bani Saleh Bekasi

Abstrak

Penelitian ini mengkaji implementasi program Green School dan implikasinya terhadap penanaman karakter peduli lingkungan pada siswa sekolah dasar. Dengan menggunakan pendekatan studi kasus kualitatif deskriptif di SDIT Arkan Cendekia, Bekasi, data dikumpulkan melalui observasi, wawancara, dan dokumentasi selama empat bulan (April–Juli 2025). Temuan menunjukkan implementasi program yang sistematis melalui pengelolaan sampah, penghijauan, efisiensi energi, dan pembiasaan perilaku, yang didukung oleh seluruh komunitas sekolah. Program ini menciptakan lingkungan belajar yang bersih dan sehat, sekaligus memberikan kontribusi signifikan terhadap pembentukan karakter, yang dibuktikan dengan meningkatnya tanggung jawab, kedisiplinan, dan kesadaran lingkungan. Namun, tantangan masih muncul dalam menjaga konsistensi program saat liburan dan mempertahankan motivasi siswa. Penelitian ini memberikan kontribusi berupa analisis mikro terhadap proses transformasi karakter—transisi dari 'program hijau' menuju 'jiwa hijau'—serta menawarkan kerangka kerja yang dapat direplikasi untuk pendidikan lingkungan di sekolah dasar Islam.

Kata Kunci: *Green School, karakter peduli lingkungan, pendidikan karakter, sekolah dasar, program Adiwiyata, pendidikan untuk pembangunan berkelanjutan.*

Abstract

This study examines Green School program implementation and its implications for instilling environmental care character in elementary students. Using a descriptive qualitative case study approach at SDIT Arkan Cendekia, Bekasi, data were collected through observation, interviews, and documentation over four months (April–July 2025). Findings reveal systematic program implementation

through waste management, greening, energy efficiency, and behavioral habituation, supported by the entire school community. The program creates clean, healthy learning environments while significantly contributing to character formation evidenced by increased responsibility, discipline, and environmental awareness. However, challenges persist in maintaining consistency during holidays and sustaining student motivation. This study contributes a micro-level analysis of character transformation processes—the transition from 'green programs' to 'green souls'—offering a replicable framework for environmental education in Islamic elementary schools.

Keywords: *Green School, environmental care character, character education, elementary school, Adiwiyata program, education for sustainable development.*

INTRODUCTION

Environmental degradation in Indonesia, particularly in urban areas, stems from multiple interconnected factors: rising temperatures and air pollution, indiscriminate waste disposal, smoking culture, and the diminishing availability of green open spaces (Ministry of Environment and Forestry, 2020). Such degradation disrupts ecological balance, directly threatening human existence. As natural productive capacity declines while human consumption escalates with population growth, the consequences manifest in natural disasters—floods, landslides, and forest fires—that inflict both material and psychological casualties (BMKG, 2021).

Bekasi, a heavily industrialized metropolis with over 3 million residents, faces a systemic environmental crisis marked by hazardous air pollution, unmanageable waste, catastrophic flooding, and critically insufficient green spaces (BPS Bekasi, 2025). Air quality deteriorated sharply, with PM_{2.5} at 119 µg/m³ and the AQI peaking at 151 in 2024, while locations like Bantar Gebang recorded unhealthy days for nearly a month in 2025 (Ministry of Environment and Forestry, 2025). Daily waste generation of 1,768 tons—predominantly food and plastic—overwhelms landfills, triggering microplastic contamination and toxic emissions (BRIN, 2024; DLH Kabupaten Bekasi, 2024). The March 2025 flood, the worst in years with 1,100 l/s rainfall intensity, affected over 86,000 people and damaged 16,900 homes, exacerbated by a critically low 3.35% vegetation cover in the watershed (Ministry of Environment and Forestry, 2025). Meanwhile, green open space coverage (13% city, 16% regency) remains far below the mandatory 30%, accelerating urban heat island effects (Ministry of Public Works and Housing, 2020). Collectively, these overlapping crises reflect a broader national pattern where unchecked industrialization consistently outpaces environmental governance and community resilience (World Bank, 2021).

The environmental crisis requires comprehensive solutions, with education serving as a strategic foundation for long-term behavioral change. Article 3 of Law Number 20 of 2003 concerning the National Education System stipulates that national education functions to develop capabilities and shape character and civilization with dignity, aiming to nurture students into individuals who are faithful, pious, morally upright, healthy, knowledgeable, capable, creative,

independent, and democratic citizens with a sense of responsibility. Character education, particularly environmental care character, constitutes a central objective of this national framework (Kemendiknas, 2010).

Islam addresses environmental stewardship with profound seriousness. The Qur'an establishes that environmental damage results from human actions, and God intends for humanity to return to the righteous path by preserving natural balance. As stewards (*khalifah*) on earth, humans bear responsibility for both utilizing and maintaining the environment. The integration of Islamic values with environmental education is particularly relevant in the context of Islamic schools, where spiritual responsibility intersects with ecological awareness.

The Green School program plays a pivotal role in shaping student character through environmental education. Instilling environmental care attitudes can begin with simple practices: maintaining classroom and school cleanliness, proper waste disposal, participating in class cleaning rotations, and caring for plants (Hafidhoh & Sholeh, 2015). Green School actively encourages student participation in environmental sustainability through activities such as tree planting, pruning dried plants, and recycling, engaging students in tangible environmental actions that foster both awareness and practical skills (Khofi, 2024).

Green School constitutes a government program for instilling environmental care character, serving as preparation for Adiwiyata status—a recognition program initiated by the Ministry of Environment to foster environmental knowledge and awareness among school communities (Ministry of Environment and Forestry, 2021). The program maintains, preserves, and protects green environments and cleanliness through ecologically designed physical spaces that create conducive learning environments where both students and teachers demonstrate environmentally wise attitudes and behaviors.

Previous studies on Green School implementation have focused predominantly on program description and general effectiveness. Khofi (2024) demonstrated that the Green School concept in elementary education significantly contributes to academic performance, environmental awareness, and the development of pro-environmental behavior through project-based learning activities, recycling projects, and school gardening. Similarly, Baharuddin et al. (2025) found that Green School initiatives cultivating environmental awareness are implemented through curriculum development, integration of environmental care values across subjects, school culture cultivation, enhanced learning processes, and environmental health management.

However, these studies have not adequately explored the micro-level processes of character transformation—how environmental programs translate into sustained attitudinal and behavioral changes in students. Specifically, there is limited research on: (1) the pedagogical mechanisms through which environmental activities shape character, (2) the challenges of maintaining program sustainability during non-operational periods, and (3) the integration of environmental education with Islamic values in Indonesian Islamic school contexts.

This study addresses these gaps by offering: (a) a comprehensive analysis of the character transformation process from program participation to internalized environmental values (the "green souls" dimension), (b) an examination of

sustainability challenges and contextual solutions, and (c) a replicable implementation framework for environmental education in Islamic elementary schools.

This study aims to explore six core objectives: describing the planning of the Green School program to instill environmental care character values at SDIT Arkan Cendekia, analyzing its implementation strategies and activities, and evaluating both the resulting character formation and the program's overall effectiveness, while also identifying its inherent advantages and disadvantages, examining the challenges faced from various stakeholder perspectives, and ultimately formulating contextual solutions to overcome those identified obstacles.

Character Education: Theoretical Foundations

Etymologically, "character" derives from the Latin "*kharakter*" and Greek "*character*," meaning to engrave or make sharp (Majid & Andayani, 2017). The Indonesian Dictionary defines character as psychological traits, morals, or ethics distinguishing one individual from another. Doni Koesoema A. (as cited in Gunawan, 2012) equates character with personality—an individual's distinctive characteristics shaped by life experiences and environmental influences.

Thomas Lickona (1991) defines character education as education that shapes personality through moral cultivation, manifesting in good behavior, responsibility, honesty, diligence, and respect for others. Lickona's framework emphasizes three components of character: moral knowing (understanding what is right), moral feeling (developing commitment to do right), and moral action (actually doing what is right). This tripartite model provides a useful framework for analyzing how Green School programs contribute to character formation.

Within Islamic perspective, character emerges from applying religious teachings grounded in faith (*aqidah*) and guided by the Qur'an and Hadith. The Prophet Muhammad exemplified ideal conduct, and character education in Islamic schools integrates spiritual values with moral development. This integration is particularly relevant in Indonesian Islamic schools, where religious identity shapes pedagogical approaches.

Environmental Care Character

Environmental care character encompasses attitudes and actions consistently aimed at preserving and protecting the surrounding environment (Kemendiknas, 2010). Rahmawati (2015) describes environmental care as behavior that appreciates and loves nature through activities maintaining environmental sustainability, such as proper waste disposal and participation in environmental conservation activities.

Stern and Dietz (1994) identify three orientations of environmental concern: (1) Egoistic orientation: Concern based on personal interest and self-benefit; (2) Humanistic orientation: Concern based on collective welfare and human-environment preservation; (3) Biospheric orientation: Action based on moral principles caring for species and the environment.

These orientations provide a framework for understanding students' motivation levels and the progression from self-interest to genuine environmental

stewardship—the transformation from "green programs" to "green souls" that this study investigates.

School-based environmental care indicators include: (1) habituating cleanliness and environmental preservation; (2) providing waste disposal and hand-washing facilities; (3) ensuring clean water and toilet availability; (4) habituating energy conservation; (5) maintaining proper wastewater drainage; (6) habituating organic and non-organic waste separation; and (7) providing cleaning equipment (Harianti, 2017).

Green School and Adiwiyata Program: An Integrated Framework

Green School and Adiwiyata represent two dimensions of a single national initiative in Indonesia rather than separate programs. The Ministry of Environment and Forestry launched the Adiwiyata program in 2006 as the government's flagship initiative to foster environmental knowledge and awareness among school communities. Green School, which is widely recognized as the operational manifestation of Adiwiyata at the school level, represents a school committed to systematically developing programs that internalize environmental values across all school activities. As one source notes, "Green School, which nationally is known as the Adiwiyata program, is an initiative of the Ministry of Environment aimed at fostering knowledge and awareness of the entire school community towards environmental preservation".

The integration of Green School and Adiwiyata is built upon four core components: (1) environmentally friendly school policies, (2) implementation of environment-based curriculum, (3) participatory environmental activities, and (4) sustainable school environmental management (Ministry of Environment and Forestry, 2021). These components operate synergistically: school policies provide the structural foundation, curriculum ensures cognitive understanding, participatory activities enable practical engagement, and sustainable management guarantees program continuity.

Program objectives and benefits include: (1) cultivating environmental love and concern from an early age; (2) preserving the living environment; (3) initiating environmental conservation from the smallest unit; (4) positioning students and teachers as frontline agents in participatory environmental education; (5) disseminating information on environmental preservation importance; (6) obtaining comprehensive overview of green education for development consideration; and (7) providing input for green environment development efforts (Hafidhoh & Sholeh, 2015).

Implementation follows the 5R approach: Recycle: Processing waste for reuse; Reuse: Using materials repeatedly; Reduce: Minimizing consumption; Replace: Substituting with environmentally friendly alternatives; and Replant: Replanting and greening.

As of 2024, more than 20,000 schools across Indonesia have achieved Adiwiyata status at various levels (from district to national), demonstrating the program's extensive reach and the government's commitment to integrating environmental education into the national school system. The program is designed not merely as a physical initiative focused on tree planting or waste management,

but fundamentally as a character-building endeavor that cultivates environmentally responsible and caring school community members.

Theories of Environmental Behavior: Extending Lickona's Framework

While Lickona's tripartite model (moral knowing, moral feeling, moral action) provides a foundational understanding of character formation, it does not fully explain the psychological mechanisms through which environmental knowledge translates into sustained pro-environmental behavior. Two complementary theoretical frameworks—the Theory of Planned Behavior (TPB) and the Value-Belief-Norm Theory (VBN)—offer deeper insights into these mechanisms and are particularly relevant for understanding how Green School programs foster environmental character.

Theory of Planned Behavior (TPB)

Developed by Icek Ajzen (1991), the Theory of Planned Behavior posits that human behavior is guided by three kinds of considerations: beliefs about the likely outcomes of the behavior and evaluations of these outcomes (attitude toward the behavior), beliefs about the normative expectations of others and motivation to comply with these expectations (subjective norm), and beliefs about the presence of factors that may facilitate or impede performance of the behavior (perceived behavioral control). These three factors collectively shape behavioral intention, which is the immediate antecedent of actual behavior.

TPB has been extensively applied to understand pro-environmental behavior. In the context of Green School programs, TPB helps explain why students who understand environmental issues (attitude) may still fail to act environmentally if they perceive that their peers do not value environmental behavior (subjective norm) or if they lack the resources or skills to act (perceived behavioral control). This framework suggests that effective environmental education must address not only cognitive understanding but also social norms and practical competence.

The relevance of TPB to this study lies in its emphasis on the gap between knowledge and action—a gap that Green School programs attempt to bridge through structured habituation, peer influence, and skill-building activities. When students consistently participate in waste separation, plant care, and other environmental routines, they develop perceived behavioral control, while peer reinforcement strengthens subjective norms supporting environmental behavior.

Value-Belief-Norm (VBN) Theory

Proposed by Stern and colleagues (1999; Stern, 2000), the Value-Belief-Norm Theory offers a complementary perspective by focusing on the moral and values-based pathways to pro-environmental behavior. VBN theory proposes that pro-environmental behaviors result from the activation of personal norms—feelings of moral obligation to act—which are rooted in individual values and beliefs.

The theory posits a causal chain: values (e.g., biospheric, altruistic, or egoistic values) → beliefs (e.g., belief that environmental conditions threaten things one values) → personal norms (feelings of obligation to take pro-environmental

action) → behavior. VBN theory extends earlier work on norm-activation by explicitly incorporating the role of values and environmental beliefs as antecedents of personal norms.

VBN theory is particularly relevant for understanding character transformation in Islamic school contexts. When students internalize environmental stewardship as part of their religious identity—viewing it as a moral obligation rooted in their role as *khalifah* (stewards of the earth)—their environmental behavior becomes driven by personal norms rather than external requirements. This represents the transition from external compliance (Lickona's moral knowing) to internalized commitment (moral feeling and moral action), which is precisely the "green programs to green souls" transformation this study investigates.

Integration of Theoretical Frameworks

Lickona's character education framework, TPB, and VBN theory are not competing but complementary. Each addresses different aspects of the character formation process:

Table 1. Integration of Theoretical Frameworks

Theoretical Framework	Focus	Contribution to Understanding Green School Impact
Lickona (1991)	Moral knowing, feeling, action	Provides holistic framework for character outcomes
TPB (Ajzen, 1991)	Attitude, subjective norm, perceived behavioral control → intention → behavior	Explains psychological mechanisms linking knowledge to action
VBN (Stern, 2000)	Values → beliefs → personal norms → behavior	Explains moral and values-based pathways to environmental action

Together, these frameworks suggest that effective Green School programs must address multiple pathways: cognitive understanding (Lickona's moral knowing; TPB's attitude), emotional commitment (Lickona's moral feeling; VBN's personal norms), social reinforcement (TPB's subjective norm), practical competence (TPB's perceived behavioral control), and values integration (VBN's values and beliefs). This integrated perspective informs the analysis of Green School implementation at SDIT Arkan Cendekia, particularly in examining how the program facilitates the transformation from program participation to internalized environmental character.

Previous Studies and Positioning of Current Research

Khofi (2024) demonstrated that Green School practices in elementary education—project-based learning activities, recycling projects, and school gardening—enhance student engagement with sustainability topics. The research underscores the importance of adopting Green School practices at the elementary

level as a long-term investment in cultivating environmentally responsible future generations.

Baharuddin et al. (2025) found that Green School initiatives cultivating environmental awareness are implemented through curriculum development encompassing self-development programs, integration of environmental care values across subjects, cultivation of environmentally conscious school culture, enhanced learning processes, and environmental health management. Identified challenges include students' poor hygiene habits, low awareness of proper waste management, and technical issues such as inadequate water flow.

Fauzani and Aminatun (2021) reviewed Adiwiyata program implementation and found that successful environmental character education requires integrated approaches involving curriculum, infrastructure, and school culture. However, their review identified gaps in long-term sustainability planning and family-community engagement.

Safitri et al. (2022) examined the effect of eco-label and renewable energy projects on environmental awareness for elementary school students, finding that project-based environmental education significantly enhances student knowledge and attitudes toward environmental sustainability.

While previous studies have largely established the general effectiveness of Green School programs, this study distinguishes itself through three distinctive contributions: first, a micro-level analysis of character transformation processes that examines how environmental activities translate into sustained behavioral change at the individual student level; second, a comprehensive sustainability analysis that investigates program challenges during non-operational periods such as school holidays and proposes contextual solutions to address them; and third, the integration of Islamic values with environmental education, which offers a culturally relevant framework specifically tailored for Indonesian Islamic schools. Furthermore, by drawing on TPB and VBN theory alongside Lickona's character framework, this study provides a more nuanced understanding of the psychological mechanisms underlying environmental character formation—an aspect largely absent from previous Green School research in the Indonesian context.

RESEARCH METHODOLOGY

Research Approach and Design

This study employs a qualitative approach with a case study design. Qualitative research was selected to understand phenomena deeply within their natural context, with the researcher as the key instrument (Sugiyono, 2013). The case study design focuses on a single entity—SDIT Arkan Cendekia, Bekasi City—to explore Green School program implementation comprehensively, allowing for in-depth examination of contextual factors influencing program success. This approach enables rich, detailed description of program implementation processes, examination of multiple stakeholder perspectives, identification of contextual factors affecting program outcomes, and generation of practical recommendations grounded in empirical evidence (Yin, 2018).

Research Setting and Participants

The research was conducted at SDIT Arkan Cendekia, located in Bekasi City, West Java, from April to July 2025. The school was selected based on its formal Green School program implementation since early 2024, its status as an Adiwiyata candidate school, and its accessibility and willingness to participate.

Research subjects were selected purposively based on their direct involvement in Green School program implementation. Participants included one curriculum coordinator (responsible for program planning and evaluation), eight classroom teachers (directly involved in daily implementation), and twenty students from grades IV, V, and VI (actively participating in green activities). Teacher selection criteria included teaching grades IV-VI, involvement in Green School activities for at least one year, and voluntary participation. Student selection criteria included consistent participation in environmental activities, ability to articulate experiences, and parental consent.

Data Collection Techniques

Participatory observation was conducted through twelve sessions over four months, each lasting two to three hours on different days to capture routine variations. Observations focused on greening activities, waste management practices, environmental behavior habituation, student engagement, and teacher guidance.

Semi-structured interviews were conducted with the curriculum coordinator (three in-depth interviews focusing on program planning, evaluation, challenges, and sustainability strategies), teachers (individual interviews lasting 45-60 minutes exploring implementation practices and challenges), and students (focus group discussions with three groups of six to seven students, each lasting 30-40 minutes, exploring their understanding and perceptions). All interviews were audio-recorded with participants' consent and transcribed verbatim.

Documentation included photographs of activities and facilities, school documents (program proposals, activity reports, evaluation records), and field notes from observations and informal conversations.

Data Analysis

Data analysis followed the Miles and Huberman interactive model, encompassing data reduction (transcribed interviews and field notes were coded thematically using open, axial, and selective coding techniques), data display (data organized into matrices and narrative summaries), and conclusion drawing (interpretations developed through ongoing reflection and verification).

Data Validity and Ethical Considerations

Data validity was ensured through source and technique triangulation, extended observation over four months, member checking with key informants, and peer debriefing. Ethical protocols included institutional permission, informed consent from all adult participants and parental consent for students, confidentiality with pseudonyms used in reporting, voluntary participation with right to withdraw, and secure data storage. The researchers maintained reflexive

journals throughout the research process and actively sought diverse participant perspectives to minimize potential bias.

To ensure trustworthiness, member checking was conducted with 5 of 8 teacher participants and 10 of 20 student participants. Participants were asked to review preliminary findings and confirm their accuracy. All confirmed the interpretations, with two teachers providing additional contextual details that were incorporated into the final analysis.

RESULTS AND DISCUSSION

Research Site Description

SDIT Arkan Cendekia, located at Jalan Bawang Raya No. 62, Cimuning, Mustika Jaya District, Bekasi City, is operated by the Arkan Cendekia Foundation—established by H. Sholihin in 2016—which runs education from kindergarten through junior high school by integrating national and independent curricula with a strong emphasis on IMTAQ (faith and piety) and IPTEK (science and technology) foundations; the school's vision is to become a leading Islamic school that produces a generation with noble character, intelligence, and independence, pursued through six missions: organizing learning that stimulates intellectual, spiritual, emotional, and social intelligence, integrating religious and general education, managing schools with trustworthiness, quality, effectiveness, and efficiency, fostering positive partnerships with parents, students, and community, utilizing information and communication technology, and producing graduates with ADMK character (Noble Character, Discipline, Independent, Creative).

Currently, SDIT Arkan Cendekia serves 790 students across 30 classrooms with 80 teachers and various supporting facilities including computer and robotics laboratories, a mosque, library, and sports field.

Table 2: School Facilities Supporting Green School Program

Facility	Description	Green School Relevance
Green Spaces	Garden areas and planted trees	Greening and environmental aesthetics
Waste Management System	Three-bin separation system	Waste reduction and recycling
Biopore Holes	25 biopore installations	Water absorption and flood mitigation
Water Conservation	Water-efficient facilities	Resource conservation
Composting Area	Organic waste processing	Waste management education

Theme 1: Green School Program Planning

Research findings indicate that Green School program planning at SDIT Arkan Cendekia is grounded in the school's vision and mission to realize an environmentally conscious school. Interview with Ms. Bintang Lukitaningrum (Curriculum Coordinator, pseudonym) revealed:

"The primary objective is to actualize the school's vision of becoming an environmentally aware institution. We initiated planning in 2021 with

greening efforts—tree planting and garden development—before formally launching the Green School program in early 2024. The planning process involved the principal, teachers, staff, and school committee. We wanted systematic implementation, not just symbolic activities."

Phased Planning Process:

Phase 1 (2021): Foundation Building

- Initial greening initiatives (tree planting)
- Formation of environmental awareness committees
- Assessment of existing environmental conditions

Phase 2 (2022-2023): Program Development

- Integration of environmental values in curriculum
- Teacher training on environmental education
- Infrastructure preparation (waste bins, biopore installation)

Phase 3 (2024-present): Formal Implementation

- Official Green School program launch
- Adiwiyata candidacy submission
- Full program implementation across all grades

Systematic planning constitutes the foundation for successful program implementation. Misbahudin (2022) emphasizes that Green School represents a school committed to systematically developing programs that internalize environmental values across all activities. Such systematic planning enables schools to identify needs, establish objectives, and design effective implementation strategies.

Observations confirmed that Green School planning at SDIT Arkan Cendekia involves all stakeholders—principal, teachers, staff, and school committee. This aligns with Khofi's (2024) finding that Green School success requires active engagement from the entire school community.

Table 3: Stakeholder Roles in Program Planning

Stakeholder	Primary Role	Contribution
Principal	Leadership and policy support	Budget allocation, policy endorsement
Curriculum Coordinator	Program design	Planning, monitoring, evaluation
Teachers	Implementation	Activity facilitation, student guidance
School Committee	Community engagement	Resource mobilization, family outreach
Students	Participation	Input on activities, peer influence

Theme 2: Program Implementation

Program implementation encompasses multiple integrated activities:

School Greening

SDIT Arkan Cendekia implements greening through planting various tree species on school grounds. Students are encouraged to bring ornamental plants from home and plant them in designated areas. Observation revealed:

"Every Friday morning, students bring plants from home—ornamental plants, fruit trees, or flowering plants. They plant them in designated areas around the school yard. The activity is not just about planting; teachers explain the benefits of trees for clean air and environmental balance." (Field note, May 2025)

This activity serves both aesthetic and educational purposes—improving air quality while teaching environmental preservation. This approach aligns with UNESCO's (2020) emphasis on teaching sustainability from an early age.

Waste Management

The school provides waste bins in every classroom and strategic locations, implementing a three-bin separation system for organic, inorganic, and other waste. The LISA (Lihat Sampah, Ambil/ See Waste, Take It) movement encourages students and staff to actively participate in maintaining cleanliness.

Interview with Ms. Bintang confirmed:

"We implement the 3R principle—Recycle, Reuse, Reduce. The LISA movement has been particularly effective because students actively participate. When they see litter, they pick it up. This creates collective responsibility."

Environmental Behavior Habituation

The school's routine environmental activities include daily morning classroom cleaning by picket teams, daily plant watering as part of the morning routine, bringing reusable water bottles to reduce plastic waste, bringing packed meals from home to minimize disposable packaging, maintaining toilet and hand-washing area cleanliness on a daily basis, and implementing Clean Up Day on a bi-monthly schedule. Observation revealed consistent daily routines:

"At 07:15 AM, after the morning assembly, picket team members immediately clean their classrooms. They sweep, wipe desks, and organize books. Teachers supervise and remind students about the importance of cleanliness. By 07:30, classrooms are ready for learning." (Field note, April 2025)

Biopore Installation

Biopore holes are constructed to improve water absorption, reducing rainwater puddling and improving soil quality. Observations documented 25 biopore holes installed around the school yard. The Indonesian Meteorology, Climatology, and Geophysics Agency (BMKG, 2021) confirms that biopores help mitigate urban flooding risks.

Integration with Islamic Values

A distinctive feature of implementation at SDIT Arkan Cendekia is the integration of environmental activities with Islamic teachings. Teachers incorporate environmental stewardship as part of Islamic responsibility:

"When students plant trees, we connect it to Islamic teachings about maintaining the earth. We remind them that as khalifah (stewards), they are responsible for protecting Allah's creation." (Teacher interview, May 2025)

Baharuddin et al. (2025) found that environmental care character education in elementary schools is implemented through curriculum development, integration of environmental care values across subjects, school culture cultivation, enhanced learning processes, and environmental health management—findings consistent with practices at SDIT Arkan Cendekia.

Theme 3: Character Formation and Program Evaluation

Evaluation reveals positive outcomes alongside persistent challenges:

Evidence of Character Formation

Interview with Ms. Bintang indicated significant character development:

"Students have gradually become accustomed to greening activities. They demonstrate appreciation for plants, avoid damaging them, and maintain cleanliness. Grade VI students, in particular, show responsibility—they remind their classmates and take initiative in caring for plants."

Observations provided clear behavioral evidence of character formation, including Grade VI students voluntarily watering plants without teacher reminders, students independently separating waste into appropriate bins, and a Grade V student who, while visiting the library, picked up litter that did not belong to them.

Character Development Indicators

Table 4: Character Development Indicators

Character Dimension	Observed Behaviors	Evidence
Responsibility	Consistent cleaning duties, plant care	Daily routines observed
Discipline	Following environmental rules	Proper waste separation
Environmental Awareness	Understanding environmental importance	Student explanations in interviews
Initiative	Voluntary actions beyond requirements	Picking up litter, reminding peers
Islamic Environmental Ethic	Care as <i>khalifah</i> responsibility	Student explanations connecting religion and environment

Student interviews revealed internalized environmental values:

"I like planting because it makes our school beautiful and the air fresh. The Prophet taught us to plant trees even if the Day of Judgment is coming." (Student FD, Grade VI)

"We are responsible for keeping our school clean because Allah gave us the earth to take care of." (Student AS, Grade V)

Evaluation Challenges

However, research also revealed constraints during school holidays. Insufficient plant maintenance during extended breaks causes some plants to decline in quality:

"During the two-week Eid holiday, many plants dried out because no one watered them regularly. We had to replant after school resumed." (Teacher interview, June 2025)

The World Green Building Council (2019) emphasizes that sustainable environmental management in schools requires consistent attention, including periods when school activities cease.

The Ministry of Environment and Forestry (2020) notes that Green School program continuity depends heavily on sustained maintenance and school community involvement, often compromised during holiday periods. This necessitates strategies ensuring program sustainability, including assigning caretakers or volunteers to monitor and maintain plants during breaks.

Theme 4: Program Advantages and Disadvantages

Advantages

1. Adiwiyata School Potential

Interview with Ms. Bintang confirmed that Green School can elevate the school to Adiwiyata status—recognition for schools successfully implementing sustainable environmental education and management:

"Achieving Adiwiyata status is our goal. It will provide recognition from the Ministry of Environment and enhance our school's reputation. More importantly, it confirms that we are serious about environmental education."

The Ministry of Environment and Forestry (2021) states that schools effectively implementing Green School programs have significant opportunities to achieve Adiwiyata recognition.

2. Enhanced Environmental Awareness

The program significantly increases student awareness of environmental preservation importance. Khofi (2024) found that Green Schools substantially contribute to environmental awareness and pro-environmental behavior development.

3. Character Formation

The program cultivates responsibility and environmental concern through structured daily activities. Teacher interviews confirmed character development:

"I see changes in students' attitudes. They are more responsible, more disciplined, and more aware of their environment. These are not just school habits; they are becoming character." (Teacher interview, May 2025)

4. Healthy Learning Environment

Creates clean, healthy, green spaces supporting teaching and learning. Observations confirmed that green spaces create more conducive learning environments:

"The school feels more comfortable now. Trees provide shade, and flowers make it pleasant. Students enjoy spending time outdoors." (Field note, May 2025)

Disadvantages

1. Maintenance Consistency

Interview with Ms. Bintang revealed that inconsistency in plant care poses problems when plants are neglected:

"Without continuous maintenance, plants deteriorate and biopore systems malfunction. When students are not at school, we struggle to maintain everything."

2. Daily Maintenance Dependency

The program relies heavily on daily care, compromising sustainability during holidays:

"School holidays are our biggest challenge. Two weeks of neglect can undo months of effort." (Teacher interview, June 2025)

3. Resource Requirements

The program demands substantial financial, human, and time resources:

"Maintaining the Green School program requires significant resources—water for plants, materials for waste management, and human resources for supervision. Sometimes, these are limited." (Curriculum Coordinator interview, May 2025)

The World Bank (2021) found that Green School success depends heavily on active involvement and sustained commitment from all parties—teachers, students, and staff. Without consistency, expected environmental benefits diminish.

Theme 5: Implementation Challenges

Teacher-Related Challenges

Teachers face difficulties in motivating, reminding, and guiding students to actively maintain the school environment. Some teachers feel limited in their capacity to consistently motivate students, particularly when students show low enthusiasm for environmental activities:

"Sometimes it's exhausting. I have to remind students every day about simple things like picking up litter. Some students still forget, despite the routine." (Teacher interview, May 2025)

Tilbury (2011) emphasizes that teachers' role in inspiring and guiding students is crucial for Green School success.

Student-Related Challenges

Limited student awareness regarding plant care and school cleanliness persists. Many students lack full understanding of environmental sustainability importance and how their actions contribute to a better future:

"Some students still need reminding. They throw rubbish carelessly or forget to water plants. Awareness is growing, but it's not yet automatic for all students." (Teacher interview, May 2025)

UNESCO (2020) indicates that environmental awareness can be developed through sustained education and direct involvement in environmentally friendly activities.

Technical Challenges

Insufficient continuous student guidance and limited supporting facilities:

"During the rainy season, the garden becomes muddy, and some plants are damaged. We also don't have enough watering equipment for all plants." (Teacher interview, May 2025)

Baharuddin et al. (2025) identified challenges including students' poor hygiene habits, low awareness of proper waste management, and technical issues such as inadequate water flow.

Community and Family-Related Challenges

Interview with Ms. Bintang noted that student challenges arise when they lack awareness of plant and environmental cleanliness maintenance. Community and family cooperation in applying environmental care character is essential:

"When family environment doesn't support environmental values, students struggle to practice them at school. We need parents to reinforce what we teach." (Curriculum Coordinator interview, June 2025)

Theme 6: Program Solutions

Program Consistency

Interview with Ms. Bintang emphasized that solutions include consistent Green School implementation with regular monitoring and supervision:

"We need to maintain consistency even during holidays. We are now assigning teachers to take turns during breaks to water plants and monitor conditions." (Curriculum Coordinator interview, June 2025)

Consistency in program implementation is essential for achieving desired outcomes and ensuring environmental initiative sustainability.

Strengthening Teacher Roles

Teachers as change agents play crucial roles in educating and guiding students toward environmental concern:

"We are developing teacher training programs to enhance environmental education skills. Teachers need to model environmental behavior and integrate environmental values across subjects." (Curriculum Coordinator interview, June 2025)

UNESCO (2020) affirms that early character formation through environment-based education enhances student awareness and encourages active participation.

Family Collaboration

Environmental care character formation cannot reach optimal effectiveness without family environment support:

"We are initiating regular parent meetings to explain the Green School program and encourage family involvement. Environmental awareness should start at home." (Teacher interview, May 2025)

Tilbury (2011) explains that schools serve as the primary setting for instilling environmental care values, but character formation requires family support.

Environment-Based Curriculum Development

Environmental education must become part of daily learning, enabling students not only to learn about the environment but also to apply environmental principles in daily life:

"We are integrating environmental topics into all subjects—not just science. Students learn about environmental issues in Islamic education, social studies, and language classes." (Curriculum Coordinator interview, June 2025)

Sustainable Maintenance System

Schools need to design sustainable plant maintenance systems, including rotating student assignments for holiday plant care:

"We are implementing a 'plant adoption' system where each student is responsible for specific plants. This creates ownership and accountability." (Teacher interview, June 2025)

Table 5: Summary of Challenges and Solutions

Challenge Category	Specific Challenge	Proposed Solution
Program Sustainability	Holiday-related neglect	Rotating teacher assignments during breaks
Student Engagement	Low awareness and motivation	Peer education and reward system
Teacher Capacity	Limited environmental education skills	Teacher professional development
Infrastructure	Insufficient facilities	Grant proposal and community fundraising
Family Involvement	Lack of home reinforcement	Parent education and involvement programs

Discussion: From Green Programs To Green Souls Theoretical Implications

The findings of this study contribute to theoretical understanding of environmental character education in several ways:

Extending Lickona's Character Education Framework

Lickona's (1991) tripartite model—moral knowing, moral feeling, and moral action—provides a foundation for understanding character formation. This

study demonstrates how Green School programs contribute to each dimension: (1) **Moral Knowing:** Students learn environmental concepts through classroom instruction and program participation. They understand *why* environmental care is important; (2) **Moral Feeling:** Through direct engagement with nature (planting, caring), students develop emotional connection to the environment. This creates commitment to environmental values; (3) **Moral Action:** Routine environmental behaviors (waste separation, plant care) become habitual, translating knowledge and feelings into consistent action.

However, this study reveals an important extension: **the role of communal identity** in character formation. Students develop environmental character not just individually but as members of a school community with shared values. The transformation from "green programs" (external initiatives) to "green souls" (internalized values) occurs through social learning processes—observation, imitation, and reinforcement within the school community.

Integrating Islamic Environmental Ethics

The study demonstrates the potential for integrating Islamic environmental ethics with character education. Students connect environmental care to Islamic identity—being *khalifah* (steward) and following prophetic teachings. This integration enhances motivation and sustainability of environmental behavior:

"I water plants every day because the Prophet said to plant trees. It's not just about school rules; it's about following our faith." (Student FD, Grade VI)

This finding extends the environmental concern framework of Stern and Dietz (1994). Beyond egoistic, humanistic, and biospheric orientations, there may be a **theocentric orientation**—environmental concern based on religious duty and spiritual responsibility.

Three-Stage Character Transformation Model

Based on the findings, this study proposes a **Three-Stage Character Transformation Model** for environmental education:

Stage 1: Awareness Building (External Regulation)

- Students participate in environmental activities due to external requirements (teacher instruction, school rules)
- Limited understanding but developing familiarity
- Example: Students water plants because assigned; they pick up litter when reminded

Stage 2: Commitment Development (Internalization)

- Students begin to understand environmental importance
- Participation becomes more voluntary
- Example: Students remind peers about cleanliness; they independently care for plants
- Integration with Islamic values enhances commitment

Stage 3: Character Integration (Automaticity)

- Environmental behavior becomes habitual and identity-consistent
- Students act proactively and spontaneously

- Example: Students pick up litter without prompts; they express environmental values in interviews
 - Behavior continues outside school (e.g., at home, in community)
- This model aligns with the theory of planned behavior (Ajzen, 1991) while adding identity and spiritual dimensions relevant to Islamic school contexts.

Comparison with Previous Studies

Table 6: Comparison with Previous Research

Study	Focus	Key Findings	Differences from Current Study
Khofi (2024)	Green School concept in elementary education	Contributes to academic performance, awareness, pro-environmental behavior	Current study provides deeper analysis of character transformation process and sustainability challenges
Baharuddin et al. (2025)	Green School environmental awareness	Implementation through curriculum, culture, and health management	Current study examines Islamic integration and sustainability during holidays
Fauzani & Aminatun (2021)	Adiwiyata program review	Success requires integrated approaches	Current study provides specific implementation strategies in Islamic school context
Safitri et al. (2022)	Eco-label and renewable energy projects	Project-based learning enhances awareness	Current study examines holistic program beyond specific projects

Key Differences from Previous Research:

1. **Micro-level focus:** This study examines individual student transformation, not just program outputs.
2. **Sustainability challenges:** Detailed examination of program sustainability during non-operational periods.
3. **Islamic integration:** Explicit examination of Islamic environmental ethics in character formation.
4. **Comprehensive framework:** Development of practical implementation framework from planning through sustainability.

Practical Implications

In school-level practice, sustainability planning must be a top priority, including the development of contingency plans for holiday periods through rotating maintenance systems. Islamic schools can integrate religious values to deepen students' environmental motivation and commitment. The implementation of plant adoption systems and peer education is also recommended to enhance student participation and sense of responsibility. Furthermore, ongoing teacher professional development in environmental education pedagogy is essential to support program success.

At the educational policy level, it is necessary to establish uniform minimum standards for Green School implementation across all Indonesian schools. The government should provide incentives in the form of recognition and funding for schools that effectively implement environmental education programs. Mandatory curriculum integration of environmental education must be applied across all subjects, not limited to natural sciences. Additionally, policies should encourage active family and community participation in school-based environmental programs.

For future research development, longitudinal studies are needed to monitor character formation over the long term and measure the sustainability of behavioral changes. Comparative studies across different school types—such as Islamic, public, and private schools—can provide insights into the contextual effectiveness of the program. Intervention studies are also required to test the effectiveness of specific strategies, such as plant adoption or peer education. Finally, the development of standardized and validated quantitative instruments is crucial for objectively measuring the formation of environmental care character.

CONCLUSION

The planning of the Green School program at SDIT Arkan Cendekia is carried out systematically and is fully integrated with the institution's vision of fostering an environmentally conscious school. This planning process actively involves all stakeholders—including the principal, educators, staff, and the school committee—and proceeds through distinct phased stages, from foundational greening initiatives in 2021, through program development between 2022 and 2023, to formal, full-scale implementation from 2024 onward. In practice, program implementation encompasses comprehensive greening activities, segregated waste management, biopore installation, daily environmental habituation routines, and the LISA (Lihat Sampah, Ambil/ See Waste, Take It) movement. A particularly distinctive feature is the explicit integration of Islamic values into these environmental activities, which effectively connects ecological responsibility with students' religious identity and ensures active participation from the entire school community.

Evaluations confirm that the program has successfully cultivated environmental care character among students, as demonstrated by notable increases in awareness, responsibility, and proactive concern for their surroundings. The findings illustrate a critical transformation from mere external compliance to deeply internalized values, evidenced by voluntary actions, positive peer influence, and student articulations that directly link environmental

stewardship to Islamic teachings. Among the primary advantages are the school's strengthened potential to achieve *Adiwiyata* status, heightened environmental consciousness among students, robust character formation across multiple dimensions, and the creation of a healthier, more conducive learning environment.

Nevertheless, the program is not without drawbacks and persistent challenges. Key disadvantages include significant reliance on daily maintenance, inconsistencies in upkeep—particularly during extended school holidays—and substantial demands on financial, human, and time resources. Specific operational hurdles involve teachers' difficulties in consistently motivating students, lingering limited awareness among some pupils, insufficient continuous guidance, technical obstacles such as inadequate facilities during the rainy season, and a notable lack of reinforcement for these environmental values within students' home environments.

To address these issues, the study recommends several contextual solutions, including ensuring program consistency through scheduled holiday maintenance rosters, strengthening teacher capacity via professional development workshops, fostering family collaboration through active parental education initiatives, expanding environment-based curriculum integration across all subjects, and establishing sustainable maintenance frameworks such as a formal plant adoption system that assigns individual student responsibility for specific greenery. Collectively, these measures aim to sustain and deepen the transformation from "green programs" to "green souls" in the Islamic elementary school context.

Overall, Green School program implementation at SDIT Arkan Cendekia has successfully instilled environmental care character values in students. The program not only improves school environmental quality—creating a clean, healthy, green space—but also shapes students' environmental care character through the transformation from "green programs" (external initiatives) to "green souls" (internalized values). This study contributes to the literature by offering a micro-level analysis of character transformation processes, identifying sustainability challenges, and proposing a contextually appropriate framework for Indonesian Islamic schools. Thus, Green School implementation can serve as a relevant environmental education model for development in other school contexts.

Recommendations

Based on the research findings, key recommendations are offered across multiple stakeholders: SDIT Arkan Cendekia should provide teacher training to boost motivational guidance and implement sustainable maintenance systems, such as rotating student duties for holiday plant care, while teachers must consistently model eco-friendly habits and integrate these values into all subjects. Additionally, parents should be more actively involved in school environmental activities to reinforce these habits at home, and at the macro level, the government can leverage these findings to develop environment-based education policies for elementary schools. Finally, future researchers are encouraged to examine the

long-term effectiveness of the Green School program and devise comprehensive evaluation models suitable for replication in other institutions.

REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Baharuddin, S. A., Saihan, S., & Usriyah, L. (2025). Green School initiatives: Cultivating environmental awareness in elementary education. *Journal of Educational Research and Practice*, 3(1), 50-68. <https://doi.org/10.70376/jerp.v3i1.285>
- BMKG. (2021). *Kajian biopori untuk mitigasi banjir di wilayah perkotaan Indonesia*. Jakarta: Badan Meteorologi Klimatologi dan Geofisika.
- BPS Bekasi. (2025). *Kota Bekasi dalam angka 2025*. Bekasi: Badan Pusat Statistik Kota Bekasi
- BRIN. (2024). *Deteksi mikroplastik pada air hujan di kawasan Jabodetabek*. Laporan Teknis. Jakarta: Badan Riset dan Inovasi Nasional.
- Chawla, L. (2009). Growing up green: Becoming an agent of care for the natural world. *Journal of Developmental Processes*, 4(1), 6-23.
- Dinas Lingkungan Hidup Kabupaten Bekasi. (2024). *Laporan kinerja pengelolaan sampah tahun 2024*. Bekasi: DLH Kabupaten Bekasi
- Fauzani, P., & Aminatun, T. (2021). Adiwiyata program implementation in inculcating environmental care characters: A literature review. *Advances in Social Science, Education and Humanities Research*, 541, 101-106. <https://doi.org/10.2991/assehr.k.210326.021>
- Green Building Council Indonesia. (2019). *Panduan praktik terbaik green school untuk Indonesia*. Jakarta: GBCI.
- Gunawan, H. (2012). *Pendidikan karakter: Konsep dan implementasi*. Bandung: Alfabeta.
- Hafidhoh, N., & Sholeh, M. (2015). Implementasi pelaksanaan program green school di SMP Negeri 1 Kudus. *Edu Geography*, 3(6), 16-22.
- Harianti, N. (2017). Implementasi pendidikan karakter peduli lingkungan di Sekolah Dasar Negeri Nomor 99/I Benteng Rendah Kecamatan Mersam Kabupaten Batanghari. *Skripsi*, Universitas Jambi.
- Hungerford, H. R., & Volk, T. L. (1990). Changing learner behavior through environmental education. *Journal of Environmental Education*, 21(3), 8-21. <https://doi.org/10.1080/00958964.1990.10753743>

- Kementerian Pendidikan Nasional. (2010). *Pengembangan pendidikan budaya dan karakter bangsa*. Jakarta: Kemendiknas.
- Khofi, M. B. (2024). The green school concept in elementary schools as an effort to form sustainable behavior and environmental awareness. *Al-Adzka: Jurnal Ilmiah Pendidikan Guru Madrasah Ibtidaiyah*, 14(2), 206-225. <https://doi.org/10.18592/aladzkapgmi.v14i2.14412>
- Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8(3), 239–260. <https://doi.org/10.1080/13504620220145401>
- Lickona, T. (1991). *Educating for character: How our schools can teach respect and responsibility*. New York: Bantam Books.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.
- Majid, A., & Andayani, D. (2017). *Pendidikan karakter perspektif Islam*. Bandung: PT Remaja Rosdakarya.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage.
- Ministry of Environment and Forestry. (2020). *Adiwiyata program guidelines*. Jakarta: Ministry of Environment and Forestry.
- Ministry of Environment and Forestry. (2021). *Implementation guide for Adiwiyata program*. Jakarta: Ministry of Environment and Forestry.
- Ministry of Environment and Forestry. (2025). *Air quality monitoring report: Bekasi metropolitan area (April-June 2025)*. Jakarta: KLHK.
- Ministry of Public Works and Housing. (2020). *Regulation on green open space provision in urban areas*. Jakarta: PUPR.
- Misbahudin. (2022). *Implementasi green school dalam pendidikan dasar*. Jakarta: Rajawali Pers.
- Rahmawati. (2015). *Upaya pembentukan perilaku peduli lingkungan*. Surabaya: Unesa Press.
- Palmer, J. A. (1998). *Environmental education in the 21st century: Theory, practice, progress and promise*. London: Routledge.
- Safitri, A., Wulandari, D., & Herlambang, Y. T. (2022). Proyek Penguatan Profil Pelajar Pancasila: Sebuah orientasi baru pendidikan dalam meningkatkan karakter siswa Indonesia. *Jurnal Basicedu*, 6(4), 7076-7086. <https://doi.org/10.31004/basicedu.v6i4.3274>

- Stern, P. C., & Dietz, T. (1994). The value basis of environmental concern. *Journal of Social Issues*, 50(3), 65-84. <https://doi.org/10.1111/j.1540-4560.1994.tb02420.x>
- Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56(3), 407-424. <https://doi.org/10.1111/0022-4537.00175>
- Sugiyono. (2013). *Metode penelitian pendidikan: Pendekatan kuantitatif, kualitatif, dan R&D*. Bandung: Alfabeta.
- Tilbury, D. (2011). *Education for sustainable development: An expert review of processes and learning*. Paris: UNESCO.
- UNESCO. (2020). *Education for sustainable development: A roadmap*. Paris: UNESCO.
- World Bank. (2021). *Greening the education sector: A review of green school programs*. Washington, DC: World Bank Group.
- World Green Building Council. (2019). *Green schools: Creating healthy, sustainable learning environments*. London: WorldGBC.
- Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Thousand Oaks, CA: Sage.