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Fostering Environmental Awareness Through School-Based Programs: A Case Study of the Adiwiyata Initiative in Indonesian Elementary Education

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ABSTRACT

Environmental degradation remains a pressing issue globally and in Indonesia. School-based programs such as the Adiwiyata Initiative aim to instill environmental awareness and sustainable behaviors among students from an early age. However, the extent to which such programs influence behavior beyond school settings remains underexplored. This qualitative case study examined the implementation and impact of the Adiwiyata Program at SD Negeri Lowokwaru 5 Malang, Indonesia. Data were collected from 24 participants—including students, teachers, parents, and school administrators—through in-depth interviews, observations, and document analysis. Thematic analysis was conducted using Miles and Huberman's interactive model. Findings revealed that the program effectively enhanced students' environmental awareness and behaviors within the school context. Activities such as composting, recycling, and project-based learning fostered ecological responsibility. School leadership and teacher involvement were key drivers of success. However, behavior change at home was less consistent, primarily due to limited environmental literacy among parents and uneven support from families. The study highlights the potential of participatory, school-based environmental education to shape pro-environmental behavior. However, long-term sustainability requires stronger integration with family and community contexts. Parental training and cross-sector collaboration are recommended to reinforce environmental values beyond the classroom. While the Adiwiyata Program positively impacted students' environmental habits at school, its influence at home was limited. Bridging this gap through community engagement and parental involvement is essential for fostering enduring environmental awareness in children.

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1. INTRODUCTION

Environmental issues remain one of the most pressing global challenges in the modern era, affecting various aspects of human life. Problems such as air pollution, land degradation, clean water scarcity, and increasing waste volumes indicate that public environmental awareness remains inadequate and requires serious attention (Zare, Niknami, Heidarnia, & Hossein Fallah, 2019) and (Yamamura, Managi, & Tsutsui, 2019). This environmental degradation is also a critical concern in Indonesia, marked by rising levels of pollution, natural resource exploitation, and the declining health of ecosystems. In response, environmental education has emerged as an essential strategy to foster ecological responsibility among younger generations. Specifically, school-based environmental education offers a contextual, structured, and sustainable approach to instilling environmental values in students from an early age (Velazquez, Daepp, & Black, 2019) and (Sugaya et al., 2019)..

Previous studies have demonstrated that Adiwiyata implementation positively contributes to shaping students' environmental character. Research by (Ji, DuBois, & Flay, 2021) and (Jamshidifarsani, Garbaya, Lim, Blazevic, & Ritchie, 2019) highlights that students in Adiwiyata schools tend to exhibit environmentally responsible behaviors such as proper waste disposal, energy saving, and active involvement in conservation activities. Nonetheless, challenges persist in extending the program's influence beyond school boundaries. (Lin, Su, & Huang, 2019) underscores that the effectiveness of Adiwiyata hinges not only on internalizing values within the school but also on the involvement of families and communities. Without reinforcement at home, school-based environmental habits may not be sustained.

One of Indonesia's flagship initiatives in this field is the Adiwiyata Program, developed by the Ministry of Environment and Forestry. This program aims to transform schools into environmentally conscious institutions through curriculum integration, participatory environmental activities, and the development of eco-friendly infrastructure. Several studies have demonstrated the effectiveness of Adiwiyata in fostering pro-environmental attitudes and behaviors among students, particularly in promoting practices such as waste segregation, energy conservation, and school greening projects (Muratori et al., 2019) and (Kim, Choe, & Kaufman, 2019).

However, despite its success within school settings, a recurring issue persists: the sustainability of these values outside the school environment. Research by (Rochester, Weiland, Unterman, McCormick, & Moffett, 2019) and (Nickerson, Tulledge, et al., 2019) found that students often fail to replicate environmentally responsible behaviors at home, largely due to limited environmental awareness among families and a lack of program continuity beyond the school grounds. This gap suggests that for school-based environmental programs to have a broader societal impact, there must be stronger linkages between schools, families, and communities.

Addressing this gap is critical, especially in schools like SD Negeri Lowokwaru 5 Malang, which has implemented the Adiwiyata Program since 2018 but has not advanced beyond city-level recognition. Although the school has shown progress through 13 structured environmental working groups and recent leadership initiatives, there remains limited evidence on how these efforts translate into environmental awareness in both school and family domains.

This study seeks to fill that gap by analyzing the extent to which the Adiwiyata Program influences students' environmental awareness at school and at home. Specifically, the study aims to examine: (1) How the school implements the Adiwiyata principles to foster environmental awareness; and (2) What supporting and inhibiting factors affect the program's impact on students' environmental behavior in the family and community context.

2. METHODS

2.1. Research Approach

This study employed a qualitative research approach with a case study design to explore the impact of the Adiwiyata Program on students' environmental awareness at SD Negeri Lowokwaru 5

in Malang, Indonesia. The qualitative method was selected for its ability to capture complex social phenomena in natural settings and to explore the perceptions, experiences, and subjective meanings of the participants involved (Silverman et al., 2019; Morgan et al., 2019). The study focused on how students, teachers, the school principal, and parents responded to and engaged in environmental character development practices initiated through the Adiwiyata Program. This design enabled the researchers to investigate the phenomenon in its real-life context and to gain in-depth insights from participants' experiences and perspectives.

2.2. Research Subjects and Site

The research subjects consisted of upper-grade students, class teachers, the school principal, the Adiwiyata coordinator, and students' parents or guardians. Informants were selected using purposive sampling based on their active involvement in the implementation of the school's environmental programs. SD Negeri Lowokwaru 5 in Malang was chosen as the research site due to its consistent participation in the Adiwiyata Program since 2018 and its wide range of thematic environmental activities involving both students and families. The total number of participants was 24, consisting of: 10 upper-grade students, 6 class teachers, 1 principal, 1 Adiwiyata coordinator, and 6 parents/guardians of participating students. These groups were chosen to capture diverse perspectives across the school ecosystem.

2.3. Data Collection and Analysis

Data were collected using three primary techniques: in-depth interviews, limited participatory observation, and document analysis. Semi-structured interviews were conducted to gather insights into informants' perceptions of the program's impact on students' environmental behavior, both at school and at home. Observations focused on students' participation during environmental activities, while documents included school archives, Adiwiyata reports, and visual documentation of program implementation. To ensure the credibility of findings, methodological and source triangulation was conducted as recommended by (Ollila & Macy, 2019**;** Payne & Journell, 2019).

The primary research instrument was the researcher (human instrument), supported by interview guides, observation forms, and documentation checklists. These tools were developed based on the dimensions of environmental awareness proposed by (Behizadeh et al., 2019), encompassing general beliefs and values, personal attitudes, and environmental knowledge.

Data were analyzed thematically using an interactive model comprising data collection, data reduction, data display, and conclusion drawing, as outlined by (Cleovoulou & Beach, 2019; Oliveira & Barnes, 2019). Thematic coding was applied to identify patterns, relationships among categories, and underlying meanings of the data. Validation was performed through member checking with informants and peer debriefing with environmental education experts to ensure the scientific accuracy and reliability of the interpretations.

The study adhered to ethical research standards. Prior to data collection, informed consent was obtained from all participants, including written permission from parents for student participation. Participants were informed about the research objectives, the voluntary nature of their involvement, and their right to withdraw at any time without consequences. All data were anonymized, and confidentiality was maintained throughout the study.

The interview questions were guided by themes aligned with the dimensions of environmental awareness (beliefs, attitudes, and knowledge). The detailed interview blueprints are provided in the Appendices**,** while a summary of the topics includes: students' participation and perception, teacher strategies and observations, school leadership roles, and parental involvement.

Interview instruments were developed for each respondent group—students, teachers, the principal, and parents—and were organized according to environmental awareness indicators. These

indicators guided the formulation of questions to explore understanding, involvement, and evaluation related to the Adiwiyata Program. The instrument matrices are presented in Tables 1–4.

Table 1. Interview Instrument Blueprint for Students

No	Aspect	Indicator
1	Knowledge of the Adiwiyata Program	Students' understanding of how the Adiwiyata Program is implemented in the school
2	Role and Involvement in the Program	Students' participation and experiences in implementing Adiwiyata activities at school
3	Barriers and Challenges	Students' perception of difficulties or obstacles encountered during Adiwiyata implementation

Table 2. Interview Instrument Blueprint for Teachers

No	Aspect	Indicator
1	Impact of the Adiwiyata Program on Environmental Awareness	Teachers' assessment of the effectiveness of the Adiwiyata Program in raising students' environmental awareness
2	Evaluation of Program Outcomes	Observed changes and achievements resulting from the implementation of the Adiwiyata Program
3	Suggestions for Program Improvement	Recommendations for enhancing the implementation and outcomes of the Adiwiyata Program

Table 3. Interview Instrument Blueprint for the School Principal

No	Aspect	Indicator
1	School Efforts to Develop Environmental Awareness	Efforts to connect classroom learning with home practices and ensure parents' involvement in the Adiwiyata Program
2	Impact of the Adiwiyata Program on Environmental Awareness	Observed behavioral changes among students and evaluated the program's overall effectiveness
3	Program Evaluation	Measures used to assess the success and sustainability of the Adiwiyata Program

Table 4. Interview Instrument Blueprint for Parents/Guardians

No	Aspect	Indicator
1	School Efforts to Develop Environmental Awareness	School efforts to connect classroom-based environmental education with home practices and to ensure parental involvement in Adiwiyata activities
2	Impact of the Adiwiyata Program on Environmental Awareness	Observed behavioral changes in children and perceived effectiveness of the Adiwiyata Program
3	Program Evaluation	Parents' assessment of the program's success and its influence on family environmental practices

3.4 Trustworthiness and Data Validation

To ensure the credibility and trustworthiness of the research, several validation strategies were employed. First, method triangulation was implemented by integrating data from interviews, observations, and document analysis. This approach allowed for the cross-verification of information

and helped strengthen the reliability of the findings. Second, source triangulation was applied by collecting data from diverse informants, including students, teachers, and parents. This diversity of perspectives contributed to a more comprehensive understanding of the phenomena under study.

In addition, member checking was conducted to minimize the risk of misinterpretation. Preliminary findings were shared with participants, who were invited to review and confirm the accuracy of the interpretations. This feedback loop enhanced the authenticity and validity of the data. Furthermore, peer debriefing was used as an external validation technique. Experts in environmental education were consulted to review the emerging themes and interpretations, providing critical feedback that helped refine the analysis.

Data analysis followed Miles and Huberman's interactive model, which involves three main components: data reduction, data display, and conclusion drawing. Thematic coding was employed to identify patterns and relationships among the categories within the data. To further support analytical clarity and organization, coding matrices were developed, enabling the systematic arrangement of emerging themes and enhancing the depth of the interpretative process.

3. FINDINGS AND DISCUSSION

This study revealed that the implementation of the Adiwiyata Program at SD Negeri Lowokwaru 5 Malang has significantly contributed to the enhancement of students' environmental awareness, both within the formal learning environment at school and in their daily lives at home. The findings are categorized into two main areas: (1) the school's efforts to realize the principles of the Adiwiyata Program and (2) the supporting and inhibiting factors in fostering environmental awareness among students within their families and communities.

3.1. School Efforts in Implementing the Adiwiyata Program

School leadership plays a crucial role in realizing the vision of the Adiwiyata Program. At SD Negeri Lowokwaru 5 Malang, the principal initiated various environmentally focused activities—such as tree planting, waste bank management, and recycling—which were integrated into learning. Teachers supported these efforts through contextual and project-based learning, including composting, TOGA gardening, and Clean Friday activities.

Students actively participated in these programs, showing enthusiasm in tasks like watering plants, sorting waste, and reusing materials. One student noted, *"I enjoy helping to take care of the garden and no longer throw trash carelessly,"* reflecting the affective internalization of environmental values.

Teachers encouraged creative, real-world projects like making windmills from recycled materials and practicing hydroponics. These approaches support findings by (Nickerson, Fredrick, Allen, & Jenkins, 2019) and (Timmermans, van der Werf, & Rubie-Davies, 2019) that project-based and contextual learning boost engagement and environmental awareness.

Aligned with (Bessho, Noguchi, Kawamura, Tanaka, & Ushijima, 2019) framework, the program fostered environmental knowledge, values, and attitudes through knowledge sharing, teacher modeling, and student involvement.

The following is an excerpt from the school principal's interview:

> *"We believe that environmental education must begin with example. Therefore, we are all committed to making this school a living model of environmental awareness for students, teachers, and parents alike."*

This commitment was echoed by a Grade 1 teacher, who shared:

> *"We always try to relate environmental themes to our lessons. For instance, during science class, we ask students to investigate the benefits of TOGA plants they grow themselves."*

Aisyah, a fifth-grade student, shared that her involvement in the Adiwiyata activities provided both enjoyable and meaningful learning experiences:

"I really enjoy participating in the Adiwiyata Program because it's fun and teaches me how to take care of the environment. We made crafts from used bottles, planted flowers in pots, and cleaned the school garden with our teachers. Activities like these make me feel more responsible and remind me not to litter anymore."

Figure 1. The principal and teachers consistently participate and serve as role models in environmentally friendly behavior activities.

Figure 2. (a) A teacher guiding students to plant in polybags due to limited school yard space; (b) A teacher explaining how the composter works.

Figure 3. Students' activities in the Adiwiyata Program: (a) Checking the composting process; (b) Cleaning the trash bins; and (c) Taking turns to clean the school health unit (UKS).

The implementation of the Adiwiyata Program at SD Negeri Lowokwaru 5 Malang has fostered environmentally friendly behaviors among students. Through project-based learning, students engaged in practical environmental actions such as composting, sorting waste, cultivating TOGA plants, and recycling used materials. Teachers played a vital role by incorporating environmental themes into lessons and modeling pro-environmental behavior. These activities helped students internalize environmental values cognitively and affectively.

Students reported increased awareness and responsibility. One student noted that she now avoids littering and actively cares for the school garden. Observations also showed a consistent involvement of the principal and teachers in leading environmental initiatives, which reinforces social learning. The program's integration into daily routines, such as Friday clean-up events and creative recycling projects, cultivated a sense of ecological responsibility.

3.2. Support and Challenges in Enhancing Environmental Awareness in Family and Community Settings

Parental support emerged as one of the most critical enabling factors. Many parents not only permitted their children to participate in environmental activities but also adopted Adiwiyata values at home, such as conserving water, reducing plastic use, and maintaining household cleanliness. According to the school committee head, parents are now actively involved in environmental initiatives such as community clean-ups and tree planting, indicating strong synergy between school and home environments.

Additionally, involvement from local community leaders and institutions helped strengthen the environmental education ecosystem at school. Community members participated in collaborative efforts including waste management and hygiene campaigns organized by the school. This moral and social support played an important role in fostering a conducive learning environment and expanding the program's impact beyond the school.

However, the school faced challenges in maintaining consistency in students' environmental behavior outside of school. A key issue was the disparity in behavior due to low environmental literacy among some parents and community members. Some students did not continue practicing environmentally friendly habits—such as water conservation or waste sorting—at home. These findings support (Zhang et al., 2019), who emphasized the necessity of family support to ensure sustained development of environmentally conscious character.

Further obstacles included limited teacher availability, inadequate infrastructure for organic waste processing, and weak partnerships with environmental organizations. The lack of shared understanding among families about the importance of environmental education reduced the reinforcement of Adiwiyata values at home. According to the Socio-Ecological Resilience framework by (Sabando, Puigdellívol, & Torrado, 2019), resilience in environmental systems arises from adaptive interactions among social actors (schools, families, communities) and ecological systems (physical environments). When these components fail to operate synergistically, long-term resilience is compromised.

Therefore, strategies to enhance family capacity through environmental literacy training, integrated outreach, and partnerships with external institutions are essential to bridge the gap between school-based initiatives and home practices. These efforts can facilitate a more sustainable and system-wide impact of the Adiwiyata Program.

While the program was successful at school, its influence at home varied. Some students applied their learning by encouraging family members to conserve water and manage waste. However, inconsistent environmental literacy among parents hindered broader impact. Several parents lacked awareness or motivation to reinforce Adiwiyata values at home, resulting in discontinuity of students' behavior.

Interviews revealed that children often encountered resistance or indifference when trying to apply environmental practices at home. This limitation was amplified by a lack of infrastructure for

home composting or waste segregation. The gap between school efforts and family support reduced the long-term effectiveness of the program. These findings highlight the need for integrated school-family-community strategies.

3.3. Supportive Factors

These findings align with the environmental awareness framework proposed by Nickerson, Tulledge, et al. (2019), which posits that environmental awareness emerges through the integration of values, knowledge, and attitudes, and is further reinforced by direct experience and social support. The current study corroborates previous research by Sabando et al. (2019) and Magadley, Amara, and Jabareen (2019), both of which highlight the pivotal role families and communities play in extending the reach and impact of environmental education beyond the confines of the classroom.

The results also reinforce the conceptualization of schools as agents of social change, tasked not only with the transmission of knowledge but also with the cultivation of values and behaviors conducive to sustainability. This perspective is supported by de Mendonça, da Silva Rosa, and Bello (2019), who emphasize the transformative potential of educational institutions. In this context, the Adiwiyata Program exemplifies how environmental learning transcends traditional classroom boundaries, facilitated by students' emotional and social engagement in environmentally meaningful activities.

At SD Negeri Lowokwaru 5, the Adiwiyata Program employed a participatory, context-based approach that effectively fostered positive environmental habits among students. Nonetheless, ensuring the long-term sustainability of these outcomes requires deeper community involvement, enhanced parental capacity, and the incorporation of environmental education into broader cultural norms and practices. These conclusions are consistent with findings by Vidergor, Givon, and Mendel (2019), who argue that students' active participation in environmental initiatives significantly increases their critical environmental awareness and sense of responsibility.

To achieve lasting, cross-contextual impacts that extend from school to home and the wider community, strategic reinforcement mechanisms are essential. These may include environmental literacy training for parents, partnerships with community-based organizations, and the development of incentive systems to encourage the replication of best practices beyond the school setting.

3.3.1.Impact of the Adiwiyata Program on Environmentally Friendly Habits

The Adiwiyata Program had a significant impact on shaping students' environmentally friendly behavior at SD Negeri Lowokwaru 5. Observations and interviews indicated that students consistently demonstrated environmentally aware actions such as disposing of waste properly, conserving energy and water, and participating in activities like composting, recycling, and school greening. These behaviors extended beyond school activities into students' daily routines at home, though with varying levels of consistency.

This finding supports (Yoto, Marsono, Suyetno, & Tjiptady, 2020) theoretical framework, which states that environmental awareness emerges through the interaction of three dimensions: general beliefs and values, personal attitudes, and environmental knowledge. Students' active engagement in Adiwiyata activities helped develop all three simultaneously. Teachers, serving as role models, played a crucial role in shaping students' attitudes and behaviors through exemplary actions and integration of environmental values into contextual learning.

Timmermans et al. (2019) reinforced these findings by demonstrating that student participation in environmental programs is strongly associated with the development of pro-environmental attitudes, particularly when such programs incorporate interactive and hands-on learning approaches. Within this framework, the Adiwiyata Program not only enhanced students' cognitive awareness of environmental issues but also nurtured affective dispositions, which were reflected in concrete, environmentally responsible behaviors.

Furthermore, the program's emphasis on project-based learning aligns with the principles of social constructivist theory, which posits that learners construct knowledge and internalize values through meaningful, collaborative engagement. Zare et al. (2019) highlighted that active involvement in environmental projects cultivates both social responsibility and ecological empathy. This was evident in the students' enthusiastic participation in activities such as growing TOGA (medicinal) plants, voluntarily cleaning their classrooms, and creating crafts from recycled materials—demonstrating a deepening of environmental values through experiential learning.

Overall, the Adiwiyata Program has proven to be an effective vehicle for fostering sustainable environmental habits through participatory, contextually grounded, and educational strategies. Nonetheless, maintaining the momentum of these behavioral transformations requires sustained cross-sector collaboration, particularly involving families and local communities, to reinforce and expand the impact of environmental education beyond the school environment.

3.3.2. Supporting and Inhibiting Factors in Fostering Environmental Awareness in Families and Communities

a) Supporting Factors

Parental and community support were key success factors in extending the Adiwiyata Program's impact beyond the school setting. Most parents supported their children's participation in environmental activities and even engaged in community clean-ups, waste sorting, and home gardening. Involvement of the school committee and local figures further strengthened the social network necessary for collective environmental value formation.

A study by (Zare et al., 2019) confirmed that when schools establish strong communication and collaboration with parents and communities, environmental education values are more likely to be internalized and applied within families. This synergy is consistent with Bronfenbrenner's (1979) Ecological Systems Theory in (Nickerson, Fredrick, et al., 2019), which posits that mutually reinforcing microenvironments (home and school) foster holistic child development.

In addition, the presence of a visionary school principal and well-trained teachers in environmental education reinforced institutional commitment to comprehensive Adiwiyata implementation. (Muratori et al., 2019) emphasized the importance of school leadership and organizational culture in establishing a sustainable environmental education ecosystem.

b) Inhibiting Factors

Despite existing support, the school faced several obstacles in expanding students' environmental awareness at home. A major challenge was the uneven understanding among parents regarding the importance of environmental education. Some continued to view it as solely the school's responsibility, resulting in weak reinforcement of Adiwiyata values at home and a decline in students' environmental behavior outside school.

Additional barriers included limited school resources for organic waste processing, teachers' constrained time for extra programs beyond class hours, and insufficient collaboration with environmental organizations. These challenges echo findings by (Ji et al., 2021), who noted that the lack of active family and community engagement hampers the development of comprehensive environmental awareness.

According to (Sugaya et al., 2019) Socio-Ecological Resilience Theory, these barriers highlight the difficulty of building adaptive, resilient social-ecological systems. When key actors—schools, families, and communities—fail to work synergistically, environmental resilience weakens.

To address these challenges, capacity-building strategies for families—such as environmental literacy workshops, integrated outreach efforts, and partnerships with external institutions—are essential. Such approaches can help bridge the gap between school-based and

home-based environmental practices, ensuring the program's long-term sustainability across all domains of students' lives.

3.4. Discussion

The findings of this study demonstrate that the Adiwiyata Program, when implemented through participatory and contextualized methods, can significantly influence students' environmental behavior within the school setting. The project-based activities encouraged students to interact with their environment meaningfully, supporting theories of experiential and constructivist learning. In line with (Nickerson, Fredrick, et al., 2019), the integration of values, knowledge, and attitudes proved essential for internalizing sustainable habits.

More critically, the role of the school as both a formal education provider and a social institution was evident. The strong leadership of the principal and the proactive engagement of teachers established a learning culture where environmental awareness was not only taught but practiced. This mirrors the concept of schools as agents of social transformation (de Mendonca et al., 2019). However, unlike studies that present school programs as wholly successful, our data highlight a more nuanced reality—one in which success in the classroom is tempered by uneven support at home and in the community.

The inconsistency of student behavior at home points to a significant limitation in the current implementation model. While schools invest in environmental education, these efforts can be undermined by external environments that do not reinforce the same values. This echoes the findings of (Lin et al., 2019), who stress the importance of aligning home and school environments to sustain behavioral change. Thus, any environmental education initiative must adopt a systemic approach, extending its influence beyond the school walls.

This research contributes to the discourse by examining both enabling and constraining conditions within the broader socio-ecological context. Drawing on Bronfenbrenner's Ecological Systems Theory, the study shows that students' development is shaped by interconnected systems—school, family, and community. Effective Adiwiyata implementation requires coherence across these domains. For example, while parental participation was visible in some activities, its inconsistency reveals a lack of embedded environmental literacy in the home setting.

Additionally, our findings expand on earlier research by emphasizing the importance of critical reflection in program evaluation. Rather than idealizing the Adiwiyata Program, this study acknowledges the operational barriers: limited infrastructure, budget constraints, and fragmented institutional support. These issues align with the socio-ecological resilience framework, which holds that adaptive systems require coordination, redundancy, and feedback loops to maintain functionality (Sabando et al., 2019).

In contrast to literature that often presents environmental programs in ideal terms, our findings suggest a dual reality: one of pedagogical promise and systemic constraint. To bridge this gap, future interventions should focus on three core areas: (1) enhancing parental environmental literacy through training and communication strategies; (2) forging stronger partnerships with local environmental organizations for resource mobilization; and (3) institutionalizing monitoring mechanisms to ensure continuity and scale.

In conclusion, the Adiwiyata Program at SD Negeri Lowokwaru 5 Malang serves as a valuable model of school-based environmental education. Yet, its long-term success depends not only on intra-school innovation but also on inter-sectoral collaboration. By acknowledging both strengths and shortcomings, this study offers a more comprehensive understanding of how environmental awareness can be nurtured, sustained, and extended into the broader fabric of students' lives.

4. CONCLUSION

This study explored the impact of the Adiwiyata Program on fostering environmental awareness among elementary students through a school-based initiative. The program's contextual and experiential learning methods effectively shaped students' pro-environmental behaviors within the school setting. However, its influence weakened in the household domain, revealing the necessity for greater integration between school, family, and community efforts.

The findings underscore the importance of school leadership, teacher engagement, and community involvement in promoting environmental values. At the same time, they also highlight structural limitations, such as inadequate parental reinforcement, lack of infrastructure, and resource constraints, which must be addressed to ensure program sustainability.

This research is bound by its single-case study design, which may limit the generalizability of its findings. Nonetheless, the depth of contextual analysis provides valuable insights that can inform similar initiatives across Indonesia. Policymakers are encouraged to support environmental education programs by funding school-community partnerships, providing parental training modules, and establishing monitoring frameworks that track behavioral changes beyond the school environment.

Future research should consider comparative multi-site studies to examine the scalability of Adiwiyata or similar programs. Longitudinal research could also evaluate how early environmental education influences student attitudes and practices into adolescence and adulthood. Such efforts would further solidify the role of schools as catalysts for environmental stewardship in the broader social ecosystem.

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