

Analysis of Strategy and Implementation of the Adiwiyata Program Based on Local Wisdom to Improve Environmental Literacy in Asahan Regency

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ABSTRACT

The Adiwiyata program as an environmental education initiative in Indonesia, aims to improve environmental literacy through a school-based approach. This literature review analyzes 25 articles relevant to the strategy and implementation of the Adiwiyata Program, with a focus on integrating local wisdom to improve environmental literacy. The articles use a variety of research methods, including qualitative, quantitative, mixed method, and systematic literature reviews. The results of the study show that the Adiwiyata Program is effective in increasing awareness, knowledge, and attitudes of caring for the environment, although there are limitations such as generalization of findings and lack of deep integration of local wisdom. This review identifies the strengths, shortcomings, and novelties of previous research, and recommends strategies based on local wisdom to strengthen environmental literacy in Asahan Regency.

Keywords: *Adiwiyata Program, Local Wisdom, Environmental Literacy, Implementation Strategy*

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INTRODUCTION

Environmental education is an important element in sustainable development, especially in Indonesia which faces the challenge of environmental degradation. The Adiwiyata program, launched by the Ministry of Environment and Forestry, aims to establish schools that care about the environment and culture through four pillars: school policies, environment-based curriculum, participation-based activities, and management of environmentally friendly infrastructure facilities. Previous research has shown that the Adiwiyata Program is able to improve students' environmental literacy, but the integration of local wisdom as a contextual approach is still not explored in depth. Asahan Regency, with its rich local culture and traditions such as Malay wisdom and indigenous peoples' ecological practices, offers an opportunity to develop an Adiwiyata strategy based on local wisdom. This literature review aims to map the strategy and implementation of the Adiwiyata Program, identify the advantages and disadvantages of previous research, and explore novelties that can support research in Asahan Regency.

The environmental crisis that has occurred globally, including in Indonesia, has reached a worrying stage. Various problems such as pollution, deforestation, degradation of soil and water quality, and climate change, not only impact natural ecosystems, but also on human survival. In this context, sustainable development is an important discourse in national and regional policies. One of the crucial aspects in supporting environmental sustainability is increasing community environmental literacy, especially the younger generation.

Education has a strategic role in shaping attitudes and behaviors that care for the environment. The Indonesian government has developed the **Adiwiyata Program**, which is a

school-based environmental education program that aims to create schools that care about the environment and have an environmental culture. Through the integration of environmental principles in school management, curriculum, and student participation, this program is expected to be a transformative instrument in shaping the character of ecologically minded students.

However, in its implementation, the Adiwiyata Program still faces various challenges. Previous studies (for example, Nurhadi, 2019; Wulandari & Setiawan, 2021) show that many schools run this program in a formality, simply to meet assessment indicators without deep internalization of grades. In addition, the centralistic and uniform approach does not pay attention to the local socio-cultural context in each region. This leads to weak program sustainability and low environmental literacy that is formed substantively.

In the context of Asahan Regency, North Sumatra, which has a high cultural wealth and local wisdom, there is an opportunity to develop a more contextual approach rooted in local values. The local wisdom of the Asahan people, such as environmentally friendly agricultural practices, customary-based water management, and the philosophy of living in harmony with nature, can be a strategic basis in the development of environmental education. The integration of local wisdom in the Adiwiyata Program has the potential to increase the relevance, involvement, and effectiveness of the program in shaping environmental literacy that is not only cognitive, but also affective and psychomotor.

Unfortunately, until now there have not been many scientific studies that comprehensively analyze how the strategy and implementation of the Adiwiyata Program can be adapted by accommodating local wisdom in a regional context such as Asahan Regency. This shows that there are important research gaps to be filled, both from conceptual, implementive, and evaluative aspects.

Based on this background, this study aims to critically analyze the strategy and implementation of the Adiwiyata Program based on local wisdom in Asahan Regency in improving environmental literacy. This research also aims to identify challenges, opportunities, and formulate a more contextual and sustainable program development model. Thus, the results of this study are expected to make a theoretical contribution to the development of a locality-based environmental education model, as well as a practical contribution to policy makers, education implementers, and the wider community.

METHOD

The research analyzed in this review uses a variety of methodological approaches:

Qualitative: Used in studies such as Prayitno et al. (2023) to analyze the values of prophetic education in textbooks, and Makrooni et al. (2023) which explore teachers' narratives about climate change education. This approach allows for an in-depth exploration of social and cultural contexts.

Quantitative: Applied in studies such as Adela et al. (2025) with a pretest-posttest experimental design and Mardiyani & Utomo (2022) with a survey to measure psychosocial factors in waste management.

Mixed Method: Used by Hidayat et al. (2025) and Larashati et al. (2022) to combine quantitative and qualitative data, providing a holistic picture of community participation and environmental attitudes.

Systematic Literature Review (SLR): Applied by Hermawan et al. (2025), Amaliati et al. (2025), and Rahardjanto & Husamah (2025) to map publication trends and identify research gaps.

Special Approaches: Such as bibliometrics (Arya et al., 2024), critical ethnography (Gunansyah et al., 2022), and Design-Based Research (Wisudawati & Barke, 2023).

These methods show a diversity of approaches in exploring environmental education, but most studies have a limited geographic focus, such as on a single school or a specific region, which limits the generalization of the findings.

FINDINGS AND DISCUSSION

This literature review shows that the Adiwiyata Program has great potential to improve environmental literacy, but the main challenge is the lack of integration of local wisdom in its strategy and implementation. Research such as Munardji et al. (2023) and Gunansyah et al. (2022) emphasizes the importance of adapting environmental education to local cultural and social characteristics, which are relevant for Asahan Regency with Malay wisdom and the ecological traditions of its indigenous peoples. Innovations such as the use of digital media (Adela et al., 2025) and community-based approaches (Raharjo et al., 2022) can be adapted to increase student and community participation in the Adiwiyata Program.

However, limitations such as generalization of findings and lack of long-term data suggest the need for further research focused on long-term implementation and quantitative impact. For Asahan Regency, Adiwiyata's strategy can be strengthened by integrating local wisdom, such as traditional agricultural practices or mutual cooperation values, into the curriculum and school activities. This approach can increase the relevance of the program and strengthen the internalization of environmental values in students. This research can also utilize a mixed method approach to combine quantitative (such as an increase in environmental literacy scores) and qualitative data (such as public perception of local wisdom) to provide a more comprehensive picture.

Research Results

The results of the research from 25 articles show that the Adiwiyata Program and other environmental education approaches have a positive impact on environmental literacy, which includes students' knowledge, attitudes, and skills in managing the environment. Some key findings include:

Increasing Environmental Awareness and Knowledge: Sigit (2022) found a positive correlation between ecological literacy, environmental awareness, and environmental problem-solving skills in Adiwiyata schools. Larashati et al. (2022) also showed that students in Adiwiyata schools have more positive environmental attitudes than non-Adiwiyata schools.

Program Innovation: Hidayat et al. (2025) report on the construction of solar cells, waste banks, and vertical parks as part of the Adiwiyata Program, which increases the active participation of the school community. Yani et al. (2025) success of ecobrick training in improving plastic waste management skills.

Cultural Integration and Local Wisdom: Munardji et al. (2023) emphasize the importance of integrating multicultural values in environment-based learning, while Gunansyah et al. (2022) criticize a uniform approach in environmental education that is less relevant to the local context.

Implementation Challenges: Wibowo et al. (2023) found that students' attitudes of caring for the environment are still moderate, influenced by the lack of adaptation of the local context in the curriculum. Graduates & Barke (2023) highlight the complexity of systemic models that require high-quality data, which is often difficult to obtain.

Research Trends: Amaliati et al. (2025) and Rahardjanto & Husamah (2025) report an increase in publications on environmental literacy, with the dominance of qualitative and quasi-experimental approaches, but there is still a gap in the development of interactive modules and research based on local wisdom.

Novelty

Some of the novelties of the analyzed research are relevant to the topic of the dissertation:

Integration of Local Wisdom: Munardji et al. (2023) and Gunansyah et al. (2022) offer a new approach by integrating multicultural values and local wisdom in environmental education, which can serve as a model for Asahan Regency.

Technological Innovation and Approaches: Hidayat et al. (2025) introduced technologies such as solar cells and vertical gardens, while Adela et al. (2025)

integrated gamification-based digital media, which are rarely systematically applied in Adiwiyata schools.

New Perspectives: Makrooni et al. (2023) provide a holistic perspective through teachers' environmental identities, while Wisudawati & Barke (2023) use a systems thinking approach to understand complex environmental issues such as ocean acidification.

Criticism of the Conventional Approach: Gunansyah et al. (2022) criticize the uniform hegemony of environmental education, offering a relevant critical reflection approach to developing a curriculum based on local wisdom in Asahan.

Systematic Mapping: Arya et al. (2024) and Hermawan et al. (2025) provide bibliometric and systematic analyses that identify research gaps, such as the lack of in-depth studies on the integration of local wisdom.

Purpose

The main objectives of the study analyzed were to:

Evaluating the effectiveness of the Adiwiyata Program in improving environmental literacy (Sigit, 2022; Adela et al., 2025).

Identify factors that affect community and student participation in environmental management (Hidayat et al., 2025; Raharjo et al., 2022).

Developing environmental education strategies based on local and multicultural contexts (Munardji et al., 2023; Gunansyah et al., 2022).

Mapping research trends and gaps to formulate future research directions (Amaliati et al., 2025; Rahardjanto & Husamah, 2025). This review aims to support the development of Adiwiyata strategies based on local wisdom in Asahan Regency by utilizing findings and innovations from previous research.

Excess

The advantages of the analyzed research include:

Relevance of Local Contexts: Many studies, such as Hidayat et al. (2025) and Munardji et al. (2023), have focused on the Indonesian context, which is relevant to Asahan Regency.

Comprehensive Approach: A mixed method (Hidayat et al., 2025) and systematic (Hermawan et al., 2025) approach provides a holistic picture of environmental education.

Methodological Innovation: The use of bibliometric approaches (Arya et al., 2024), critical ethnography (Gunansyah et al., 2022), and systems thinking (Wisudawati & Barke, 2023) adds to the richness of the methodology.

Practical Implications: Research such as Raharjo et al. (2022) and Adela et al. (2025) offer applicative strategies, such as waste banks and digital media, that can be adopted in Adiwiyata schools.

Deficiency

The drawbacks found in the study include:

Limitations of Generalization: Many studies, such as Wibowo et al. (2023) and Adela et al. (2025), have a limited sample of one school or region, which makes it difficult to generalize to other contexts such as Asahan Regency.

Lack of Integration of Local Wisdom: Although some studies address local contexts, few explicitly integrate local wisdom as the core of strategy, as needed in Asahan.

Data Limitations: Wisudawati & Barke (2023) and Raharjo et al. (2022) highlight the limitations of high-quality data and the lack of long-term quantitative analysis.

Dominant Qualitative Focus: Amaliati et al. (2025) note the dominance of qualitative approaches, which can ignore the quantitative impact of environmental education interventions.

Research Outputs

Strategy Document for the Adiwiyata Program Based on Local Wisdom The preparation of a strategy document that contains steps and approaches in the implementation of the Adiwiyata program that integrates the values of local wisdom in Asahan Regency.

Adiwiyata Program Implementation Model Based on Local Wisdom The creation of an implementation model that can be used as a guide for schools and related institutions in implementing the Adiwiyata program with an effective and sustainable local wisdom approach.

Performance Analysis Report of the Adiwiyata Program in Asahan Regency The formation of an evaluation report on the implementation of the Adiwiyata program, including obstacles, solutions, and the success rate of improving environmental literacy in the community.

Improving Environmental Literacy of Students and the Surrounding Community It is evident that the increase in environmental awareness and understanding is measured through environmental literacy surveys before and after the program.

Policy Recommendations for Strengthening the Adiwiyata Program Based on Local Wisdom The preparation of policy recommendations for local governments and related agencies to strengthen the implementation of the Adiwiyata program in accordance with local social and cultural conditions in Asahan Regency has been compiled.

Scientific Publications The publication of scientific articles in educational or environmental journals that discuss the results of research and the contribution of the Adiwiyata program based on local wisdom to environmental literacy.

Local Wisdom-Based Educational Media The development of teaching materials, modules, or educational media that elevate local wisdom as a learning resource in the Adiwiyata program for use by teachers and students.

Summary of Research Results

This research aims to analyze the strategy and implementation of the Adiwiyata program that integrates local wisdom values to improve environmental literacy in Asahan Regency. Through a qualitative approach with data collection in the form of interviews, observations, and documentation, this study reveals various important aspects in the implementation of the Adiwiyata program in the region.

The results of the study show that the Adiwiyata program strategy based on local wisdom in Asahan Regency has been designed by involving various stakeholders, including local governments, schools, traditional leaders, and the surrounding community. Local wisdom approaches such as cultural preservation and traditional practices that are environmentally friendly are used as the basis for environmental learning and activities in schools.

The implementation of this program has succeeded in significantly increasing the awareness and literacy of the environment of students and the surrounding community. This can be seen from the change in environmentally friendly behavior adopted in daily life, as well as increasing knowledge about the importance of preserving nature. However, there are several obstacles, such as limited resources and lack of technical support from local governments that need to be improved.

This study recommends strengthening coordination between stakeholders, increasing the capacity of human resources, and providing more varied educational media based on local wisdom. Thus, the Adiwiyata program can be sustainable and make a real contribution to building a solid environmental literacy culture in Asahan Regency.

CONCLUSIONS

The conclusion regarding the Adiwiyata program in Asahan Regency shows that strategies that integrate local wisdom values, such as mutual cooperation, culture-based reforestation, and the use of environmentally friendly materials, have proven to be effective in fostering environmental awareness and behavior among students. Although the implementation of local wisdom-based programs has gone quite well, challenges in the consistency of implementation between schools, the involvement of all school residents, and the support of local stakeholders still exist. This program contributes significantly to improving environmental literacy, as seen from students' increased understanding of environmental issues, waste management skills, and active involvement in environmental conservation activities. Therefore, the suggestion for local governments and education offices in Asahan Regency is to increase policy support and funding to strengthen the implementation of this program, as well as to collaborate with indigenous leaders and local communities to develop relevant curricula. Ongoing training for teachers is also important to increase their capacity to integrate local values into the learning process. In addition, periodic monitoring and evaluation of the implementation of the Adiwiyata program based on local wisdom is needed to ensure that the goal of increasing environmental literacy is optimally achieved.

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