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OVERVIEW OF THE IMPLEMENTATION OF ENVIRONMENTAL EDUCATION IN WILDLIFE CONSERVATION EFFORTS AT 003 LUBUK KEMBANG ELEMENTARY SCHOOL, LOCATED IN THE BUFFER ZONE OF TESSO NILO NATIONAL PARK, RIAU PROVINCE

Gambaran Implementasi Pendidikan Lingkungan Hidup dalam Upaya Perlindungan Satwa Liar di Sekolah Dasar 003 Lubuk Kembang Bunga, Kawasan Penyangga Taman Nasional Tesso Nilo, Provinsi Riau

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Abstract

Indonesia, as a mega-biodiversity country, faces huge pressure on its ecosystems and wildlife due to deforestation, exploitation of natural resources, and low environmental literacy among

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the community, including in the buffer zones of national parks. Environmental education from an early age is an important strategy in building conservation awareness and pro-environmental behavior. This study aims to describe the implementation of environmental education in wildlife protection efforts in elementary schools located in the buffer zone of Tesso Nilo National Park, Riau Province. This study uses a descriptive approach with quantitative and qualitative methods. A total of 50 students aged 8–12 years were selected using purposive sampling to complete a conservation understanding questionnaire, while in-depth interviews were conducted with two teachers. Quantitative data were analyzed using descriptive statistics, while qualitative data were analyzed thematically. The results showed that the students' initial level of understanding of wildlife conservation was still relatively low, with an average score of 60.3 ± 15.1. Environmental education in schools has been integrated into the 2013 Curriculum, but it does not specifically include material on wildlife conservation and forest preservation, nor is it supported by ongoing external education programs. The results of the study show that students' initial level of understanding of wildlife conservation is still relatively low, with an average score of 60.3 ± 15.1. Environmental education in schools has been integrated into the 2013 Curriculum, but it does not specifically include material on wildlife conservation and forest preservation, nor is it supported by ongoing external education programs. The results of this study indicate that the implementation of environmental education in the buffer zone of Tesso Nilo National Park is still not optimal in building a comprehensive understanding of wildlife conservation. There is a need to strengthen conservation-based environmental education through curriculum integration, the development of contextual educational media, and the implementation of sustainable and participatory non-formal education programs.

Keywords: conservation, education, Tesso Nilo National Park, wild animals

Abstrak

Indonesia sebagai negara mega-biodiversitas menghadapi tekanan besar terhadap ekosistem dan satwa liar akibat deforestasi, eksploitasi sumber daya alam, serta rendahnya literasi lingkungan masyarakat, termasuk di kawasan penyangga taman nasional. Pendidikan lingkungan sejak usia dini menjadi strategi penting dalam membangun kesadaran konservasi dan perilaku pro-lingkungan. Penelitian ini bertujuan untuk menggambarkan implementasi pendidikan lingkungan hidup dalam upaya perlindungan satwa liar di sekolah dasar yang berada di kawasan penyangga Taman Nasional Tesso Nilo, Provinsi Riau. Penelitian ini menggunakan pendekatan deskriptif dengan metode kuantitatif dan kualitatif. Sebanyak 50 siswa usia 8–12 tahun dipilih secara *purposive sampling* untuk mengisi kuesioner pemahaman konservasi, sedangkan wawancara mendalam dilakukan terhadap dua orang guru. Data kuantitatif dianalisis menggunakan statistik deskriptif, sedangkan data kualitatif dianalisis secara tematik. Hasil penelitian menunjukkan bahwa tingkat pemahaman awal siswa terhadap konservasi satwa liar masih tergolong rendah dengan nilai rata-rata 60,3 ± 15,1. Pendidikan lingkungan di sekolah telah terintegrasi dalam Kurikulum 2013, namun belum secara spesifik memuat materi konservasi satwa liar dan pelestarian hutan, serta belum didukung oleh program edukasi eksternal yang berkelanjutan. Hasil penelitian ini menunjukkan bahwa implementasi pendidikan lingkungan di kawasan penyangga Taman Nasional Tesso Nilo masih belum optimal dalam membangun pemahaman konservasi satwa liar secara komprehensif. Perlunya penguatan pendidikan lingkungan berbasis konservasi melalui integrasi kurikulum, pengembangan media edukatif kontekstual, serta pelaksanaan program edukasi nonformal yang berkelanjutan dan partisipatif.

Keywords**:** konservasi, pendidikan, satwa liar, Taman Nasional Tesso Nilo

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INTRODUCTION

Indonesia, as a megadiverse country (Soendjoto *et al.*, 2021), faces significant pressures on its ecosystems, including biodiversity loss due to deforestation and illegal mining activities. Various studies indicate that weak law enforcement and low participation of local communities are major factors hindering environmental protection efforts (Mubin, 2025; Nurhidayah & Alam, 2020). Although Indonesia has numerous conservation areas aimed at preserving flora, fauna, and diverse ecosystems, serious challenges such as forest fires and illegal resource exploitation continue to dominate and threaten the sustainability of these areas (Leksono *et al.*, 2023).

Globally, biodiversity is also experiencing a significant decline (Şeren & Çelekli, 2024). Factors such as climate change and habitat loss exacerbate pressures on wildlife species and natural ecosystems (Şeren & Çelekli, 2024). Several studies suggest that the rate of biodiversity loss occurs faster than the capacity of conservation efforts to restore it, thereby increasing the threat to the survival of various species in the context of global climate change (Aditya, 2025; Pasupuleti, 2024). This situation underscores the need for more innovative, adaptive, and inclusive conservation strategies to support sustainable environmental management (Dhankar *et al.*, 2025).

Enhancing public environmental literacy and awareness is a crucial factor in supporting wildlife protection and ecosystem conservation. Environmental education and awareness have been shown to substantially influence pro-environmental behavior and improve acceptance of conservation policies. Studies indicate that community involvement in environmental education initiatives can increase knowledge of wildlife protection laws and the importance of ecosystem roles, while also serving as a key mechanism to shift public perceptions and promote concrete actions in environmental conservation (Huang *et al.*, 2022; Robinson *et al.*, 2024).

Tesso Nilo National Park in Riau Province is one of the terrestrial conservation areas with high ecological value, serving as a habitat for various wildlife species (Risdayanti & Novarizal, 2024). However, this area also faces significant anthropogenic pressures, particularly in the buffer zone, such as encroachment, habitat degradation, and potential human-wildlife conflicts. These conditions demand conservation approaches that are not only structural but also educational and participatory. This study aims to provide an overview of the implementation of environmental education in wildlife conservation efforts, particularly in schools located within the Tesso Nilo National Park area in Riau Province, Indonesia.

RESEARCH METHODS

Research Subjects

This study was conducted descriptively, involving 50 elementary school students aged 8–12 years and interviews with two elementary school teachers. The students and teachers participating in this study were from 003 Lubuk Kembang Bunga Elementary School, which is located within the Tesso Nilo National Park area. Research samples were selected using purposive sampling with the inclusion criteria of being willing to participate in the study and having parental/guardian consent.

Research Design and Variables

This study employed a descriptive design with both quantitative and qualitative approaches. The independent variable was the implementation of environmental education, while the dependent variable was the students' level of understanding of wildlife conservation.

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Data Collection Methods

The quantitative approach was conducted through questionnaires completed by 50 students aged 8–12 years to describe their initial understanding of wildlife conservation and environmental education. The qualitative approach involved in-depth interviews with two teachers to obtain insights into the implementation of environmental education and educators' perceptions of the activities conducted. Quantitative data were analyzed descriptively, while qualitative data were analyzed thematically.

Data Analysis

Quantitative data were obtained from questionnaires that had undergone editing and pilot testing with three children aged 8–9 years who were not included as research subjects. The pilot test aimed to assess the clarity of the questions, the children's comprehension level, and the suitability of the questionnaire for the target age group. Questionnaire results were then analyzed using descriptive statistics, including frequency distribution, percentages, and mean values, to depict the students' initial understanding of wildlife conservation. Data analysis was performed using IBM SPSS Statistics Version 31.0.0.0.

Qualitative data were obtained from teacher interviews, transcribed verbatim, and analyzed thematically to identify the main themes regarding the implementation of environmental education. The results were presented in tables and charts for quantitative data, and as narrative descriptions supported by direct quotes from respondents for qualitative data.

RESULTS AND DISCUSSION

Results

The students involved in this study were aged between 9 and 13 years, with a mean age of 10.62 ± 0.81 years. All students attended 003 Lubuk Kembang Bunga Elementary School, located at coordinates −0.25596, 101.93484, within the Tesso Nilo National Park area (Figure 1). Based on the analysis of respondents' understanding, comprehension levels were grouped into three categories: low, moderate, and high. This classification was based on the percentage of scores obtained by respondents, with scores <56 categorized as low, 56–74 as moderate, and >74 as high.

Descriptive statistical analysis presented in Table 1 shows that the students' questionnaire scores on wildlife conservation understanding ranged from a minimum of 33.3 to a maximum of 91.7. The low comprehension category had the highest frequency, with a mean score of 44.3 ± 6.2, followed by the moderate category (17 students) with a mean of 63.0 ± 4.3, and the high comprehension category comprising 14 students with a mean score of 79.2 ± 5.6. The total number of respondents was 50 students, with an overall mean score of 60.3 ± 15.1. The coefficient of variation (CV) of 25.19% indicates considerable variability in students' understanding.

Interviews with two teachers, serving as homeroom teachers for grades 4 and 5 at 003 Lubuk Kembang Bunga Elementary School in the Tesso Nilo National Park area, revealed that environmental education has been integrated into the 2013 Curriculum (K13) rather than being offered as a separate subject. Environmental topics are taught thematically across several subjects, particularly in grade 3, covering topics such as environmental care, reforestation, and sustainable use of natural resources. The delivery of this material aims to instill environmental awareness in students from an early age.

Environmental education is also implemented through habitual activities, such as maintaining school cleanliness, participating in communal work (gotong royong), and fostering a sense of

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responsibility toward the surrounding environment. The school previously implemented a zero-plastic program, but this initiative is no longer active.

Regarding external conservation education, the teachers reported that Tesso Nilo National Park has conducted several outreach activities related to wildlife and environmental awareness; however, the last activity took place in 2020 and has not continued since. Furthermore, community service programs (Kuliah Kerja Nyata, Kukerta) carried out by university students at the school did not specifically focus on environmental education or wildlife conservation. According to both teachers, students' knowledge of wildlife is generally superficial. Students are aware of the presence of wildlife around the national park and understand that these animals are protected. However, their understanding of conservation concepts, ecological roles, and threats to wildlife remains limited and not in-depth.

Discussion

This study was conducted in February 2025 in the buffer zone of Tesso Nilo National Park. Two teachers, serving as homeroom teachers for grades 3 and 5, were interviewed to obtain insights into the implementation of environmental education in elementary schools. Based on the interviews, the 2013 Curriculum (K13) taught in grade 3 has integrated environmental education into the learning process, consistent with findings by Azima (2022), which indicate that environmental education can be incorporated thematically into the elementary school curriculum. Character development aimed at fostering environmental concern in students is conducted in stages tailored to student characteristics, covering three main aspects: (1) moral knowledge, (2) moral feelings, and (3) moral action. The purpose of conservation education initiatives is to increase public knowledge and understanding of the protection of endangered species and the need to preserve natural environments (Walwambe & Barakagira, 2024).

However, the interview results indicate that environmental education implementation at the school is still general and does not specifically include materials on wildlife conservation and forest preservation. The teachers reported that, to date, there is no specific program that introduces concepts of conservation, the ecological role of wildlife, or responsible management of forests and wildlife. Environmental education has primarily focused on cleanliness, school environment maintenance, and basic use of natural resources, without in-depth coverage of biodiversity conservation. Although the number of interviewees was limited to two teachers, which may not fully represent the perspectives of all stakeholders within the school and surrounding community, the selection of informants was purposive, considering their strategic roles as homeroom teachers. Therefore, the data are expected to provide an initial overview of program implementation.

These conditions suggest that environmental education provided at the school remains limited to the immediate environment surrounding the students, while awareness of the importance of forest and wildlife conservation, particularly related to Tesso Nilo National Park has not been optimally integrated into the learning process.

Questionnaire results from 50 students of 003 Lubuk Kembang Bunga Elementary School showed that students' initial understanding of environmental protection and wildlife conservation was still relatively low. The mean score of 60.3 ± 15.1 placed most respondents in the low to moderate comprehension categories, with substantial variability in understanding among students (CV = 25.19%). This finding indicates that, despite living in the buffer zone of the national park, students' understanding of the ecological functions of forests, the role of wildlife, and conservation principles is still underdeveloped. A similar finding was reported in Jambi by Hanif (2021), where students, although proficient in academic content, had limited understanding of the relevance of forests to their daily lives. This lack of comprehension is

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attributed to insufficient relevant and effective educational materials in the school curriculum emphasizing the importance of conservation.

Currently, environmental education in elementary schools remains integrated within the K13 curriculum and is not offered as a separate subject. Interviews revealed that environmental topics are generally taught, such as school cleanliness, reforestation, and utilization of natural resources, but do not specifically address wildlife conservation, habitat protection, or human–wildlife interactions. This general and non-contextual approach is suspected to be a factor contributing to students' low understanding of conservation issues. In contrast, contextual and locally-based environmental education has been shown to be more effective in improving ecological literacy and conservation awareness, as demonstrated in the Budongo Central Forest Reserve, where conservation education programs statistically improved knowledge, attitudes, and behaviors toward the environment and surrounding wildlife (Walwambe & Barakagira, 2024).

The geographic proximity of students to Tesso Nilo National Park should represent a strategic potential for fostering early conservation awareness. Direct exposure to natural environments, if supported by appropriate educational approaches, can enhance students' understanding, attitudes, and pro-environmental behaviors (Walwambe & Barakagira, 2024). However, interviews indicated that outreach and educational activities conducted by the national park were last held in 2020 and have not been maintained regularly. Additionally, supporting activities by external parties, such as university community service programs, have not consistently focused on environmental or conservation themes. Successful conservation efforts heavily depend on community involvement. Public awareness of the importance of forests and wildlife should be developed through relevant community-based education. Utilizing locally-focused approaches, such as awareness programs conducted by conservation-focused NGOs, can help enhance awareness and responsibility toward the environment (Fristikawati, 2021; Hindrakusuma & Carina, 2022).

The lack of cross-sector collaboration in the implementation of environmental education has limited the internalization of conservation values. This is reflected in the questionnaire results, which show a predominance of low and moderate comprehension categories and a high variation in students' understanding.

CONCLUSION AND SUGGESTIONS

Conclusion

Overall, the findings of this study indicate that the implementation of environmental education in the buffer zone of Tesso Nilo National Park is still suboptimal in fostering a comprehensive understanding of wildlife conservation.

Suggestions

It is necessary to strengthen conservation-based environmental education strategies through curriculum integration, the development of contextual educational media, and the implementation of sustainable and participatory non-formal education programs. This approach is expected to enhance conservation literacy from an early age and cultivate a generation of young people who are environmentally conscious and committed to wildlife protection.

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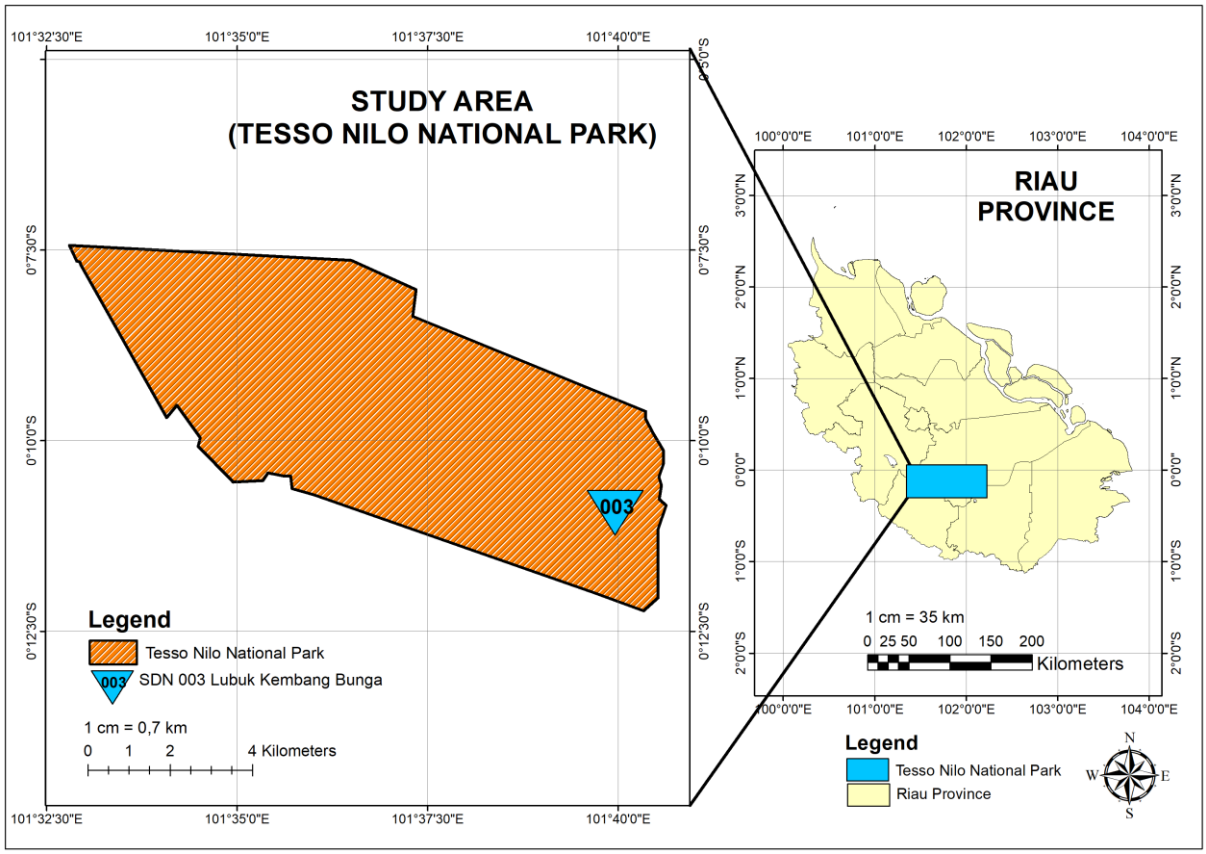

Figure 1. Research sample collection area

Table 1. Distribution of students' comprehension levels regarding wildlife conservation based on questionnaire scores

Comprehension level	Frequency	Mean
Low	19	44.3 ± 6.2
Moderate	17	63.0 ± 4.3
High	14	79.2 ± 5.6
Total	50	60.3 ± 15.1