Integrating Geopark into School-Level Curriculum in Indonesia: A Case Study at SMPN 1 Kejajar, Central Java

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ABSTRACT

Indonesia's unique position at the convergence of three major continental plates has resulted in exceptional geological diversity and high geological value. However, this location also exposes the country to significant geological hazards, including earthquakes, volcanic eruptions, tsunamis, and landslides. To maximize the positive impacts of this geological richness and minimize its potential risks, proper management, preservation, and utilization within Geopark areas are essential to support sustainability through active participation in four main elements: conservation, education, sustainable economy, and community culture. The purpose of this study is to describe how SMPN 1 Kejajar integrates Geopark into its school-level curriculum. This research employs a qualitative approach with a case study design. Data were collected through observation, interviews, and documentation. The findings show that SMPN 1 Kejajar selected several key elements as references in integrating Geopark into the school-level curriculum. The selection of these elements is based on the school's context, specific needs, and the characteristics of its students. Geopark elements are integrated into various aspects of the school-level curriculum, including: the characteristics of the school; the school's vision, mission, and goals; the organization of learning; as well as the planning of learning.

Keywords: *biodiversity, cultural diversity, geopark, school-level curriculum.*

1. INTRODUCTION

The geological condition of Indonesia, which is located at the convergence of three tectonic plates, results in a rich and valuable geological diversity. This geodiversity contains significant geoheritage linked to biodiversity and cultural diversity. It can also be utilized through the concept of sustainable geopark development, especially to support tourism destinations (Peraturan Presiden Republik Indonesia Nomor 9 Tahun 2019).

A geopark is a single or combined geographical area that contains geological diversity, biodiversity, and cultural diversity. It is managed for nature conservation, education, and sustainable local economic development, with active participation from communities and local governments. Through this approach, geoparks help promote public understanding and awareness of the Earth and the surrounding environment (Peraturan Presiden Republik Indonesia Nomor 9 Tahun 2019; Hutabarat, 2023; Insani, et al., 2023; UNESCO.org, 2025). According to Badan Geologi Kementerian Energi dan Sumber Daya Mineral (2025), Indonesia currently has 12 UNESCO Global Geopark, including Mount Batur Geopark, Belitong Geopark, Ciletuh Geopark, Gunung Sewu

Geopark, Rinjani Lombok Geopark, Toba Caldera Geopark, Raja Ampat Geopark, Maros-Pangkep Geopark, Merangin Geopark, Ijen Geopark, Kebumen Geopark, and Meratus Geopark. In addition, several national geopark are being prepared to become UNESCO Global Geopark, including the Dieng National Geopark, which was recently designated through Surat Keputusan Menteri Energi dan Sumber Daya Mineral No.172.K/GL.01/MEM.G/2025 on 7 May 2025.

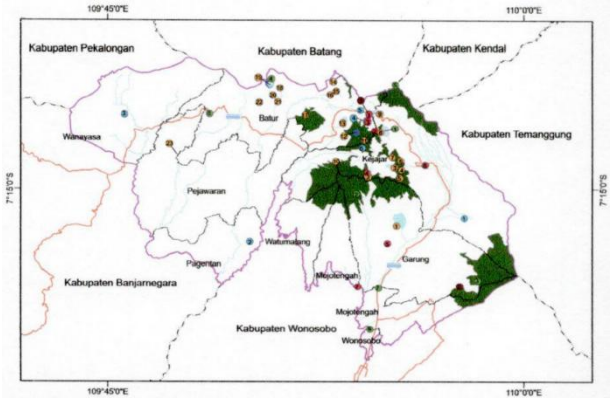

Figure 1. Map of the Delineated Area of Dieng National Geopark

The Dieng National Geopark covers a total area of 319.36 km², spanning the administrative regions of Wonosobo Regency, specifically Kejajar, Garung, Mojotengah, Watumalang, and Wonosobo Districts; and Banjarnegara Regency, including Batur, Pejawaran, Wanayasa, and Pagentan Districts. The geopark consists of 23 geosites, 8 biosites, 9 cultural sites, and 6 additional key destinations that support sustainable development (Keputusan Menteri Energi dan Sumber Daya Mineral, 2025).

Based on Peraturan Menteri Perencanaan Pembangunan Nasional/Kepala Badan Perencanaan Pembangunan Nasional Nomor 15 Tahun 2020, geopark areas, including the Dieng National Geopark, contribute to achieving the Sustainable Development Goals (SDGs), particularly in relation to quality education. The Dieng National Geopark helps raise public awareness of geological heritage and its connection to natural and cultural heritage. Geopark also encourages communities to adopt sustainable development practices, promote sustainable lifestyles, and appreciate diversity and peace.

The development of geopark, especially within the education pillar, needs to be aligned with Indonesia's national education system. Undang-undang Republik Indonesia Nomor 20 Tahun 2003 mandates that curriculum at all levels and types of education must be developed using diversification principles, based on the educational institution, regional potential, and student characteristics. Diversified curriculum development allows educational institutions to adjust their programs to local conditions and unique regional potentials. Curriculum diversification is implemented through the development of school-level curriculum (Kurikulum Satuan Pendidikan). The main references for developing this curriculum include: (1) the national curriculum framework

and structure, and (2) the school's vision, mission, and characteristics. The school-level curriculum should be a dynamic document that is continuously updated, used as a daily reference, reflected upon, and revised based on evaluation and the school's needs. According to Badan Standar, Kurikulum, dan Asesmen Pendidikan (2025), four key components must be included in the school-level curriculum: the characteristics of the school; the school's vision, mission, and goals; the organization of learning; as well as the planning of learning.

The development of the school-level curriculum aims to help school leaders design a diversified curriculum based on the identified potential and characteristics of the region, the school, and the students. This diversification is expected to strengthen the school's unique identity and support the achievement of its vision, mission, and goals. However, many schools still experience challenges in identifying local potential and uniqueness, and integrating them into their school-level curriculum. Therefore, a curriculum model that integrates local natural and cultural resources, particularly in the Dieng National Geopark area, is needed as a reference for other schools with similar regional contexts. This study aims to describe how SMPN 1 Kejajar, located within the Dieng National Geopark, integrates geopark elements into its school-level curriculum.

2. METHODOLOGY

2.1. Research Design

This study employs a qualitative approach using a case study design. According to Rahardjo (2017), a case study is a series of scientific activities carried out intensively and in depth on a program, event, or activity, whether related to individuals, communities, institutions, or organizations, to obtain a thorough understanding of the phenomenon. In this study, the case study approach is used to explore how an educational institution integrates geopark elements into its school-level curriculum.

2.2. Participants of the Study

The participants in this study were the curriculum developer team at SMPN 1 Kejajar, Wonosobo, Central Java. Participants were selected through purposive sampling to meet the research objectives. A total of 13 curriculum team members were involved: 1 school supervisor, 1 principal, 1 vice principal, and 10 teachers. SMPN 1 Kejajar was selected because it has implemented the Merdeka Curriculum, is located within the Dieng National Geopark, and was recommended by the Regional Office of Education (*Dinas Pendidikan*).

2.3. Instruments

Data were collected through observation, interviews, and documentation. The instruments used in this study included the researcher, observation and interview

guidelines (based on the school-level curriculum development guide), and a review instrument for the school-level curriculum. Observations and interviews were conducted during the researcher's visit to SMPN 1 Kejajar, while the document review took place through in-depth analysis using focus group discussions held both offline and online.

2.4. Data Analysis Techniques

The data analysis techniques used in this study include data reduction, data display, and conclusion drawing. Data reduction was conducted by summarizing the collected data into concepts, categories, or themes. Data display involved organizing information systematically in the form of narrative text, charts, matrix, or diagrams for ease of interpretation. Conclusion drawing was carried out by comparing the presented data, interpreting their meaning, and identifying key findings throughout the research process (Sugiyono, 2017; Rijali, 2018; Akbari & Seituni, 2021, Septiana, et al., 2024).

3. RESULT AND DISCUSSION

SMPN 1 Kejajar is located on Jalan Dieng Km 17 in Kejajar Village, Kejajar Subdistrict, and lies along the main road to the Dieng area, at latitude -7.2532° and longitude 109.9554°. The school has developed its school-level curriculum under the title "Geoeducation." Table 3.1 presents the geopark elements integrated into the Geoeducation Curriculum of SMPN 1 Kejajar.

Table 1. Geopark Elements in the Geoeducation Curriculum of SMPN 1 Kejajar

Element	Competency Focus
Knowledge	Analyzing geological phenomena and their relationship to community life in the geopark area
Conservation	Applying conservation efforts to geosites in the geopark area
Sustainable Economy	Analyzing the economic potential based on natural and cultural resources in the geopark area
Community Culture	Analyzing the importance of historical (human, space, and time) and cultural elements in community development within the geopark area

These four geopark elements are embedded in the four components of the Geoeducation Curriculum at SMPN 1 Kejajar.

The Characteristics of the School

In this section, SMPN 1 Kejajar describes its geographical setting, local biodiversity, and cultural traditions that are still preserved by the community. All these potentials are used in curriculum development and classroom learning. The following narratives were obtained from interviews and documentation:

"Located in the Dieng valley area, SMPN 1 Kejajar has a cool climate and is surrounded by hills. The fresh air supports students' concentration and overall well-being. The beautiful mountain landscape can be utilized as a natural laboratory for subjects such as Social Studies-Geography, Biology, and Cultural Arts. These natural conditions can be further developed through educational tourism programs or outdoor learning activities such as hiking. This natural wealth needs to be utilized to support learning and curriculum development that emphasizes the use of natural resources in the Dieng National Geopark area."

"In addition to its geological diversity, the area around SMPN 1 Kejajar has endemic highland flora and fauna such as Dieng chilies, carica, tamarillo, and Wonosobo sheep. These resources can serve as practical learning materials for Biology and Agriculture. The school has access to clean water and fertile soil for gardening practice. It is also close to local farms, such as potato, carrot, cabbage, and other vegetable plantations. SMPN 1 Kejajar collaborates with local carrot farmers and washing facilities as partners for cocurricular activities on carrot processing, which supports the agriculture-based local content in Wonosobo."

"Various traditions and cultural values are still strongly preserved in the local community. One of the most prominent traditions is the "Ruwatan Rambut Gimbal" ceremony. This tradition can be integrated into contextual learning materials. In addition, community values such as mutual cooperation (gotong-royong) become strong social capital in supporting school programs, such as community service activities and school–parent partnerships. The school can also involve cultural leaders (tokoh adat) as keynote speakers in cocurricular and extracurricular programs."

The School's Vision, Mission, and Goals

According to Badan Standar, Kurikulum, dan Asesmen Pendidikan (2025), the vision represents the long-term aspirations of the school community. The mission explains how the school achieves this vision, while the goals describe the expected outcomes within a certain timeframe based on the school's unique characteristics.

In line with that definition, SMPN 1 Kejajar has developed its vision, mission, and goals integrated with the geopark concept. The school's vision is: "To develop students with noble character, global awareness, academic excellence, digital literacy, and environmental responsibility." The "global awareness" and "environmental responsibility" vision are related to geopark and are elaborated in the mission and goals shown in Table 2.

Table 2. The Vision, Mission, and Goals of SMPN 1 Kejajar Related to Geopark

Vision Global Awareness	Vision - Environmental Responsibility
Mission: ● To develop students' mindsets so they are able to understand and respond to international issues, especially climate change. ● To foster students' critical thinking skills in addressing the challenges of global climate change.	**Mission:** ● To encourage students' active participation in programs that promote a safe, healthy, orderly, and beautiful school environment. ● To cultivate students' awareness of the geological, biological, and cultural diversity within the school environment. ● To support students' active involvement in efforts to conserve geological, biological, and cultural diversity in the school area.
Goals: ● Students develop the ability to identify the causes and global impacts of climate change by the end of the first semester. ● Students develop the ability to analyze the effects of climate change on their local or regional environment by the end of the first semester. ● Students develop the ability to propose solutions for addressing climate change by the end of the first semester.	**Goals:** ● Students develop awareness of geological, biological, and cultural diversity by the end of the academic year. ● Students develop mindsets that support the prevention of environmental degradation in their surroundings by the end of the academic year. ● Students care for cultural preservation by the end of the academic year. ● Students care for the protection of water sources within the school environment by the end of the academic year.

The Organization of Learning

SMPN 1 Kejajar organizes learning activities into intracurricular, cocurricular, and extracurricular programs. In the intracurricular program, subjects related to geopark include Social Studies (IPS), Natural Science (IPA), Craft (Prakarya), and Pancasila Education. In the Social Studies subject, the geopark-related topic is spatial connectivity in the use and conservation of natural resources. In this topic, students learn to understand the geographical diversity of the Dieng Geopark area, analyze spatial connectivity with the Dieng Geopark, identify how natural resources are utilized in the area, process information, and propose solutions for environmental conservation efforts in the Dieng Geopark. One of the products students may create in this learning process is a poster encouraging environmental preservation in the geopark area.

The geopark-related topic in the Natural Sciences subject is the interaction between living organisms and their environment. Students analyze these interactions and then design strategies to prevent and address climate change. They plan concrete and solution-oriented actions, then communicate their ideas through engaging

campaign media. Students are also encouraged to critically evaluate the steps that can be taken to protect the environment and to consider alternative actions that are appropriate and effective for the Dieng Geopark area.

In the Craft subject, the relevant topic covers the characteristics of products, materials, tools, processing techniques, packaging, and presentation of food and non-food processed products based on local environmental potential. In this lesson, students process locally grown vegetables, particularly carrots, into various food products such as wet and dry candied carrots and carrot drink powder. Beyond food processing, students also analyze appropriate packaging for the products they create.

In the Pancasila Education subject, the relevant topic focuses on the importance of preserving traditions, local wisdom, and culture as part of national identity. In this lesson, students watch a video featuring the culture, traditions, and local wisdom found in the Dieng Geopark. Working in groups, they identify information from the video and transform it into both digital and non-digital clippings. These clippings are then presented and displayed as part of a classroom wall magazine.

The efforts made by SMPN 1 Kejajar to integrate the Dieng Geopark into the intracurricular program are in line with other studies conducted in the Toba Caldera Geopark area. According to Siregar et al. (2025), several schools in the Toba Caldera Geopark have started to integrate learning content on geological formation, caldera lakes, and local wisdom into subjects such as Science, Geography, and local content courses. Teachers are trained to develop learning media based on geosites, such as student worksheets, documentary videos, and thematic maps, so that learning becomes more engaging and relevant to the surrounding environment. Moreover, the scenic beauty of the Toba Caldera combined with the rich Batak culture has made Lake Toba one of the country's main tourist destinations and part of the list of the ten "New Bali" sites (Manurung & Sinabariba, 2021).

In the **cocurricular program**, SMPN 1 Kejajar organizes *dimensi profil lulusan*, themes, and the type of cocurricular by incorporating geopark-related content that reflects the local context, as presented in Table 3.

Table 3. The Organization of Cocurricular Related to Geopark at SMPN 1 Kejajar

Outcome Profile Dimension	**Theme**	**Type of Cocurricular**	**Time Allocation**
Critical Thinking and Collaboration	Caring for the Environment of the Dieng Geopark Area-Protect, Maintain, Preserve (*Jaga, Rawat, Lestarikan - JAWARA*)	Collaborative learning across disciplines	123 learning hours (block system) from November to December 2025

Outcome Profile Dimension	Theme	Type of Cocurricular	Time Allocation
Creativity and Collaboration	Processing Local Vegetables of the Dieng Geopark	Other relevant activities	123 learning hours (block system) from May to June 2026

SMPN 1 Kejajar implements the theme "Caring for the Environment of the Dieng Geopark Area – Protect, Maintain, Preserve (*Jaga, Rawat, Lestarikan - JAWARA*)" in Grades VII, VIII, and IX. In Grade VII, students work together to identify geological, biological, and cultural diversity as well as initial conservation efforts in the Dieng Geopark through discussions and presentations. In Grade VIII, students collaborate to identify disaster threats and risks, along with conservation efforts in the Dieng Geopark, through discussions and the production of documentary videos. In Grade IX, students work together to identify the concept of sustainable development in the Dieng Geopark by producing educational media and digital conservation projects.

The theme "Processing Local Vegetables of the Dieng Geopark" is also implemented in Grades VII, VIII, and IX. In Grade VII, students collaborate to identify information about carrot commodities in the Dieng Geopark area and create simple carrot-based food products. In Grade VIII, students work together to prepare more advanced carrot-based products and design both the packaging and labeling for specialty carrot products from the Dieng Geopark. In Grade IX, students innovate by creating both food and non-food carrot-based products and attempt to market them, followed by the preparation of a final report.

In the extracurricular program, SMPN 1 Kejajar does not explicitly integrate geopark content into its extracurricular programs, such as scouting, sports, arts, and academic development (olympiads). However, the school offers self-development and school culture programs that broaden students' knowledge and awareness of the Geopark. These include literacy activities, such as promoting reading habits and developing a reading culture through fiction and non-fiction books, such as general knowledge books, encyclopedias, agriculture, and geology.

Aligned with the school culture at SMPN 1 Kejajar, geopark literacy practices implemented in other geopark areas across Indonesia may also serve as inspiration for schools. In the Ciletuh Geopark, a Geopark Corner was established in 2017 at SDN Tegalcaringin, Sukabumi. Its attractions include poetry collections related to the Ciletuh Geopark, handicrafts made by students, miniatures of several geosites, curriculum books, and geopark teaching aids and games (Ibrahim & Adiputra, 2023). In the Karangsambung-Karangbolong Geopark in Kebumen, the local Archives and Library Office has developed geopark literacy through a Geopark Corner that provides books about the geopark, information about geopark locations across Kebumen and nearby

areas, historical information and maps of each geopark destination, as well as exhibitions and posters on geology and local culture (Sundariyati & Zain, 2024).

The Planning of Learning

SMPN 1 Kejajar develops learning plans at the school level (in the form of Learning Objective Sequences/Alur Tujuan Pembelajaran-ATP) and at the class level (in the form of lesson plans). The ATP and lesson plan for intracurricular presented in this section are for the Social Studies subject, while the cocurricular lesson plan refers to the JAWARA theme.

In the Social Studies subject, the selected learning objective is to analyze spatial connectivity in relation to the use and conservation of natural resources. This learning objective is achieved over four meetings. In the first meeting, students are guided to understand the geographical diversity of the Dieng Geopark and the concept of spatial connectivity. In the second meeting, students identify how natural resources are utilized and analyze the impacts of spatial connectivity. In the third meeting, students develop solutions for conserving natural resources. In the fourth meeting, students communicate their conservation solutions and reflect on them.

In the *JAWARA* cocurricular theme, activities focus on developing students' ability to recognize and identify the geological, biological, and sociocultural diversity of the Dieng Geopark, as well as fostering curiosity and early awareness of environmental preservation. Collaboration between the Natural Sciences subject and Social Studies subject help students deepen their understanding of ecosystems, biodiversity, and pollution issues. Moreover, students are encouraged to analyze the impacts of human activities on the environment, local wisdom, nature conservation, and geological disaster mitigation. Other relevant subjects include Indonesian Language, particularly when students create slogans and conduct interviews. The *dimensi profil lulusan* emphasized in this theme are critical thinking and collaboration. The sequences of cocurricular activities include: 1) triggering discussion & creating the Dieng Geopark mind map; 2) designing the "Dieng footprint album"; 3) creating flora/fauna diary & simple geological map of the Dieng Geopark; 4) collecting evidence of cultural heritage & changes in the Dieng Geopark; 5) interviewing key community figures & creating a mini geopark campaign; 6) presenting the idea "why is Dieng Geopark unique?"; and 7) "Dieng and I" reflection.

4. CONCLUSION

The Geoeducation Curriculum of SMPN 1 Kejajar integrates geopark elements, including knowledge, conservation, sustainable economy, and community culture, into the characteristics of the school; the school's vision, mission, and goals; the organization of learning; as well as the planning of learning. This integration represents a good

practice model that can be adapted by other schools across Indonesia, especially those located within Geopark areas, as a form of curriculum diversification aligned with local contexts and needs.

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