

THE IMPLEMENTATION OF LOCAL WISDOM IN ENVIRONMENTAL LEARNING IN THE GEOGRAPHY SUBJECT AT SMA NEGERI 1 KERJO, KARANGANYAR REGENCY

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ABSTRACT

Geography education plays a crucial role in enhancing students' environmental awareness. One of the applicable approaches is the integration of local wisdom into the learning process. Local wisdom reflects the traditional ways communities have preserved environmental balance across generations. This study aims to (1) analyse the types of local wisdom in Kerjo District, (2) examine the implementation of local wisdom in geography learning, and (3) assess the impact of local wisdom on students' understanding of environmental issues. This research employs a qualitative approach using a case study method conducted at SMA Negeri 1 Kerjo, which has implemented local wisdom-based learning. The research subjects include geography teachers and students. Data collection techniques involve observation, interviews, and analysis of teaching materials and school policy documents. The collected data were analysed through data reduction, data display, and conclusion drawing. The findings of the study are as follows: (1) Kerjo District has eight types of local wisdom, namely *Nyadran*, *Bersih Desa*, *Tirakatan*, *Suran*, *Gotong Royong*, *Wetonan*, *Sedekah Bumi*, and *Rasulan*; (2) The implementation of local wisdom-based education at SMA N 1 Kerjo is not yet optimal; (3) Students' understanding of environmental topics in geography learning at SMA N 1 Kerjo needs improvement. This study highlights the importance of integrating local wisdom into geography education to strengthen students' comprehension of environmental issues. It serves as a reference for educators and policymakers in developing more contextual and applicable culturally-based curricula in environmental education.

Keywords: local wisdom; environment; curriculum; geography

INTRODUCTION

Environmental damage is often caused by a lack of awareness in managing natural resources wisely by humans (IPCC, 2014). Meeting human needs necessitates uncontrolled exploitation of the environment. Education has a role in

increasing awareness and understanding of the environment among students as agents of future change. According to a study in Hungary, more than 50% of respondents felt that their pro-environmental behaviour was often



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limited by a lack of knowledge about the environment (Zsóka et al., 2012). Thus, environmental education is expected to be a solution in successfully increasing awareness and pro-environmental behaviour (Kurniawan et al., 2024; Marlina et al., 2023; Milandi et al., 2025).

Through education, the younger generation is expected to obtain adequate education to contribute to environmental conservation efforts (Gustavo & Rakuasa, 2023; Milandi et al., 2025). In

In the context of formal learning, the integration of local aspects is an effective strategy for instilling environmental conservation values that are relevant to local conditions and culture (Wahyuni et al., 2024). Local wisdom can be viewed as a form of knowledge, belief, understanding, and insight that guides human behaviour in ecological communities that have been formed over a long period of time from customs and traditions and are influenced by their environment. Local wisdom has a connection between the community and their environment, and this knowledge plays an important role in natural resource management and ensuring long-term environmental sustainability (Calabrese Barton et al.,

2021). Unfortunately, however, its integration into formal education is still far from complete and often depends on curriculum standards. Teaching local wisdom to students as agents of change and the next generation of the nation is a concrete way to strengthen the relevance of learning while maintaining environmental sustainability and strengthening their connection with their communities and environment (Doyan & Hadiputra, 2023).

The discipline of geography is seen as being able to explore the spatial relationships between social and physical phenomena on various scales and suggest solutions to significant and persistent problems compared to other disciplines (de Miguel González et al., 2018). Geography examines local wisdom with spatial complexity, as the place where local wisdom is formed and passed down. However, the relationship between geography and culture is far more complex than a simple cause-and-effect relationship (Ramayani et al., 2025). This connection is expressed through legends, myths, and cultural practices that have been passed down from generation to generation and have existed for a long time, thus becoming the identity of indigenous peoples from



being merely local (Mahaswa & Hardiyanti, 2025). Local wisdom in a geographical perspective is not only a cultural value but also a guideline that regulates humans to be wise in interacting with the environment, helping to maintain the sustainability and balance of the ecosystem. Local wisdom in human geography has a strategic role in maintaining the existence of local wisdom that varies according to location to balance the ecosystem with changing natural conditions (Riantika & Hastuti, 2019). Thus, geography learning can be a forum for increasing environmental awareness within the local sphere, to encourage environmental awareness, especially in the living environment.

Kerjo District is one of the districts located in Karanganyar Regency, Central Java, which has a cultural background similar to the western slopes of Mount Lawu. The culture in this area is influenced by megalithic, Hindu, and Islamic cultures (Sulistyanto, 2019). In Kerjo District, evidence of this heritage can be found at the Watukandang site. However, along with the spread of Islam in Java and colonisation, there has been a significant acculturation with previous cultures. According to Sulistyanto (2019), the culture embraced by the

people of the western slopes of Mount Lawu includes mountain worship and the ongoing tradition of ruwatan. Meanwhile, Islam and its cultural practices continued to evolve and form new habits for the community in one of the villages in Kerjo District, namely Karangrejo Village (Mustikasari, 2016). On the other hand, the opening of rubber plantations created a new social structure. Since its establishment in 1912, Kerjo District has been known as a rubber plantation area owned by a state-owned enterprise, PTPN, which changed management (Septinawati, 2010). This phenomenon also influenced the socio-economic conditions of the people in Kerjo, particularly regarding land and livelihoods. Moreover, changes in social status began to emerge following the development of rubber plantations. The presence of plantations in traditional communities created a dualistic, pocket-type economy and caused dependency for village life. Unfortunately, to date, there has been no comprehensive study analysing the sociocultural transition in Kerjo District, particularly concerning how the shift from the cultural landscape of Mount Lawu's slopes to a colonial plantation area has eroded the collective memory of the community. This



phenomenon has created a knowledge gap among the younger generation regarding their own local wisdom. Therefore, this study aims to reconstruct the local wisdom values in Kerjo District and integrate them into Geography learning. Through this approach, it is hoped that students will not only understand physical space but also be able to adapt local wisdom values in

MATERIALS AND METHODS

This research employs a descriptive qualitative design with a case study approach to explore the transition of local wisdom in Kerjo District. Informants were selected through a purposive sampling technique, targeting community leaders (such as Kaum, Kaur, and elders) and educational practitioners possessing in-depth knowledge of local history and culture. Data were gathered through semi-structured interviews utilising a logical framework that progresses through identification, existence, and projection. The interview instrument is structured into three primary stages: (1) a descriptive stage to inventory forms and practices of local wisdom; (2) an analytical stage to evaluate preservation challenges and the intergenerational

knowledge gap; and (3) a strategic stage to explore the potential for integrating local values into community activities.

Meanwhile, to measure the implementation of local wisdom in learning, interviews were conducted with 11th-grade geography teachers with material on biodiversity and disasters.

The implementation of local wisdom was also measured based on students' answers using a Likert scale. The targeted respondents were students who had taken geography classes. Four classes had taken geography classes, and the students were measured using the Slovin formula. The use of this formula aims to obtain a representative sample to represent the population of students receiving Geography instruction in the 11th grade. Slovin's formula is shown in **equation 1**.

$$n = \frac{N}{1 + Ne^2} \quad (1)$$

N = required sample size

N = total population

E = margin of error

$$n = \frac{36}{1 + 36 \times (0,05)^2} = 33,03$$

Qualitative data analysis techniques are carried out using descriptive statistical analysis, and qualitative data is presented narratively and linked to quantitative data. Quantitative research



methods must contain experimental settings, data collection, data analysis, statistical testing, assumptions, and experimental authority. In contrast, qualitative research must cover research settings, including place, number, and criteria of respondents, sampling techniques, data collection procedures, validation procedures, coding, interpretation, and data presentation or data analysis techniques. Formula writing must follow international notation and symbol standards, followed by references if quoted from others.

RESULTS AND DISCUSSION

1. Forms of Local Wisdom in Kerjo Subdistrict

Local wisdom in Kerjo Subdistrict was obtained through interviews with key informants who usually serve as general affairs officers (*kaur/kaum*) working in the village administration and traditional elders. Based on the data obtained, local wisdom in Kerjo Subdistrict generally takes the form of prayer ceremonies that usually include village cleaning activities. The following is the distribution of local wisdom in Kerjo Subdistrict.

Table 1. Distribution of Local Wisdom in Kerjo Subdistrict

Village	Forms of Local Wisdom
Tawangsari	<i>Sadranan Rasulan, Bersih Desa, Bancakan, Kenduri Jumat Legi, Suran</i>
Sumerejo	<i>Nyadran, Suran, Pedayangan /Sadranan, Pesta Tani,</i>
Botok	<i>Sedekah Bumi, Bersih Desa, Bangun Dukuh, Tirakat, Suronan, Bersih Punden</i>
Karangrejo	<i>Neptu, Tirakatan, Nyadran, Metil, Bersih Dusun</i>
Plosorejo	<i>Bersih Dusun, Nyadran, Kenduri/Tirakatan</i>
Tamansari	<i>Nyadran, Bersih Desa, Tirakatan, Rasulan, Suran</i>
Kwadungan	<i>Suran, Kenduri, Tirakatan, Mualutan, Sadranan, Mapak, Bersih Desa</i>
Ganten	<i>Rasulan, Sadranan, Bersih Dusun, Rawuhan</i>
Kuto	<i>Nyadran, Bersih Desa, Kenduri, Methil, Bersih, Tepak Gantol, Bancakan,</i>
Gempolan	<i>Rasulan, Tirakatan, Bersih Dusun, Suran, Sadran</i>

Source: Researcher Analysis, 2025

The forms of local wisdom that exist in Kerjo District have many terms, even though they have the same characteristics. Generally, these cultural activities are prayer ceremonies aimed at asking for safety, prosperity, and

security, which are carried out in sacred places or commonly called *Punden*. The terms that are often used are *sadran*, *nyadran*, *sadranan*, *suran*, *tirajatan*, *pendayangan*, and *rasulan*. According to a study by Rubyarta (2022), *Nyadran* or



Sadran is a form of cultural heritage that holds that certain places are considered sacred and have sacred value. The implementation of local wisdom is carried out at certain times according to the traditional Javanese calendar, such as *Jum'at Legi* (Friday Legi), the month of *Suro*, *Satu Suro* (First *Suro*), Muharam, and memorable moments such as after harvest or the beginning of the planting season. The selection of certain days or nights is believed to be sacred, auspicious, a moment to seek blessings, and to send rewards to deceased family members (Purwaningrum, 2020).

Prayer ceremonies in each village and even hamlet have their own characteristics in carrying out these activities, as well as different times. This practice usually involves the use of offerings in the form of food that will be prayed over or served in sacred/holy places. However, as times change, some communities choose to eat the offerings that have been prayed over as a form of gratitude and to avoid wasting food. This is a change in mindset and acculturation with Islam.

Local wisdom that still preserves unique practices is *Sedekah Bumi/Bangun Dusun* in Botok Village, which still uses goat heads as offerings or tools for local

wisdom practices that will be planted in the ground on Friday, *Wage* or *Kliwon* or *Legi* in the month of *Suro*. The purpose of this practice is to ward off evil from the village. Unlike Botok Village, in Sumberjo Village, a ceremony called *Suran* is a prayer ceremony that is sometimes accompanied by gamelan or campursari music.

On the other hand, the practice of welcoming the month of *Suro* in Kwadungan Village is carried out by carrying torches around the village. In general, the local wisdom practices in Kerjo Subdistrict are a form of prayer ceremony intended to express gratitude, ask for safety, and make requests. Thus, local wisdom that is directly related to the implementation of environmental awareness practices is only through spiritual practices and village clean-ups. The *Tepak Gantol* practice found in Kuto Village involves a long bamboo pole with a cloth tied to its tip to prevent fires and a hook to catch burning objects. Although each village has its own characteristics and variations in implementation, the social and cultural significance contained in this tradition shows a standard core value, namely, maintaining cultural continuity and traditions as part of community life.



The practice of local wisdom in Kerjo Subdistrict has undergone changes over time due to modernisation and acculturation with Islam. According to key informants, many local wisdom practices have begun to be abandoned and are only carried out by a few families. The preservation of local wisdom itself is only continued by the children of families who practice it; there are no specific efforts made to preserve local wisdom. The challenges faced in preserving local wisdom are modernisation and a strong Islamic religious consciousness. Some people consider local wisdom practices to be idolatry.

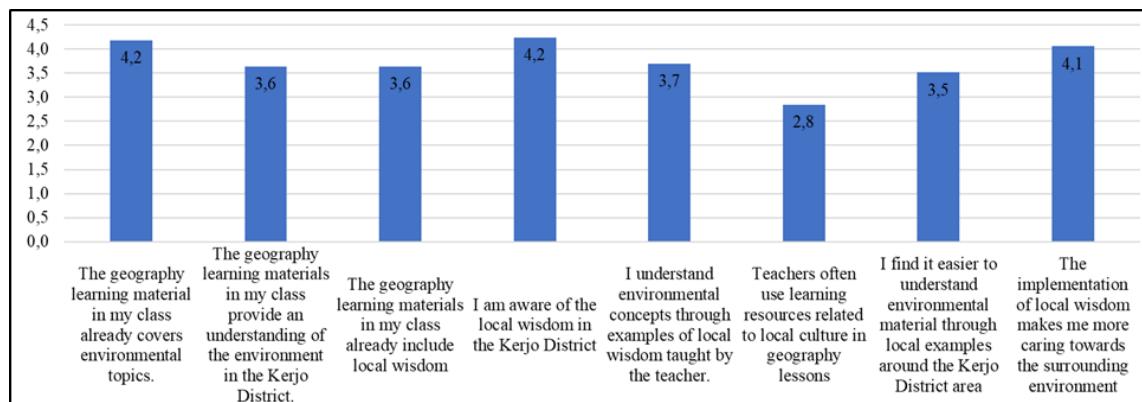


Figure 1. Eight Questions That Assess Aspects of Geography Learning Related to Local Wisdom and the Environment.

Source: Researcher Analysis, 2025

The questionnaire consists of eight questions that assess several important aspects of geography learning related to local wisdom and the environment (**Figure 1**). First, the scope of learning

materials that integrate the environment and local wisdom. Second, students' understanding of the concept of the environment in the local area is taught through learning. Third, students'



knowledge of local wisdom in the Kerjo District. Fourth, students' understanding of environmental concepts through examples of local wisdom presented by teachers. Fifth, the frequency of teachers' use of local culture-based learning resources in teaching. Sixth, the ease with which students understand environmental material using local examples. Seventh, the influence of local wisdom on students' ability to understand environmental material. Eighth, the impact of implementing local wisdom on students' awareness and attitudes towards the surrounding environment. All of these questions were designed to measure students' understanding, attitudes, and experiences in receiving material containing local wisdom values and environmental issues.

In general, the average score for the statements ranged from 2.8 to 4.2. Understanding of environmental concepts through examples of local wisdom taught by teachers (question 6) received the lowest score, namely 2.8. This shows that there are limitations in the way the material is presented or that the examples are not concrete enough, so that some students' understanding of these concepts is not yet optimal.

However, the score obtained from question 3, namely learning that already includes local wisdom, was 3.6. This score was obtained because the understanding of local wisdom provided by teachers was still general.

Based on interviews with teachers, the application of local wisdom in learning has not yet been implemented. This limitation is due to several factors, namely, limited time to implement local wisdom in learning, and insufficient time to cover topics such as disaster mitigation and biodiversity. As a result, the implementation of local wisdom has not yet been achieved.

Second, the teacher who teaches geography to 11th-grade students is not a citizen of the Kerjo subdistrict. This factor can hinder the implementation of local wisdom in learning. However, the teacher knows the cultural characteristics that exist in the Kerjo subdistrict in general, such as Nyadran, Reog, and Rasulan.

Third, students' learning characteristics prefer practical or implementation-based learning. Students prefer modern mitigation practices by recognising environmental characteristics, while in biodiversity material, students are instructed to observe their surroundings.



Environmental awareness practices implemented by teachers lead students to be more sensitive to the conditions of their surroundings (landscape) where they live, but have not yet implemented sensitivity to local cultural wisdom.

Although local wisdom has not yet been implemented in learning, the scores obtained are related to the coverage of environmental material. (Question 1) received a very high score of 4.2. This shows that students feel that the material taught is quite comprehensive and relevant to the environmental context.

The highest score was also obtained in students' understanding of local wisdom in Kerjo Subdistrict, which was 4.2. Based on interviews with teachers, several students were actively involved in practising local wisdom and as cultural actors in Kerjo Subdistrict, especially in their neighbourhoods. Several students who are not residents of Kerjo Subdistrict also agreed, noting that they are aware of the local wisdom in their living environment. Students who are not residents of Kerjo Subdistrict usually come from Jenawi Subdistrict, Mojogedang Subdistrict, and Ngargoyoso Subdistrict, which still have similar cultures.

Furthermore, the second statement, which asked about students' understanding of environmental issues and local wisdom in Kerjo Subdistrict, received a fairly good average score of around 3.6, indicating a positive response that reflects the success of learning in the space around their homes. Based on the scores obtained from question 7, it appears that most students find it easier to understand environmental material when given examples that are relevant to local conditions or their surrounding area. In summary, these scores reflect that the use of local examples in teaching environmental material significantly aids student understanding.

The score for the influence of implementing local wisdom in increasing student awareness of the environment (question 8) was high, at 4.1, which means that students feel that their knowledge of local wisdom fosters an attitude of caring for the environment. However, the teaching methods applied by teachers can still hone sensitivity to the surrounding environment through examples of landscapes, physiography of the region, potential disasters, and biodiversity in Kerjo District.



3. The Impact of Implementing Local Wisdom in the Geography Subject

Based on interviews with teachers in the field, it was found that the understanding of specific local wisdom in Kerjo Subdistrict has not been implemented in learning. However, environmental learning taught by teachers can increase environmental sensitivity with a modern approach and learning models that students like. This is demonstrated by the high scores on questions related to knowledge of local wisdom, which actually reflect general understanding rather than the concrete results of classroom learning. Through interviews with several students, they stated that they were aware of local wisdom but lacked a deeper understanding of it.

The implementation of local wisdom in geography education faces several challenges, namely limited time in geography lessons, teachers who are not native to the area, and student learning styles. This situation is reinforced by teachers' responses to questions regarding the use of local cultural learning resources, which showed low scores, indicating a lack of systematic application of local wisdom in the learning process. These challenges are also exacerbated by rapid globalisation

and modernisation, which require societies to adopt global cultures, values, and practices in general. The clash of values and the erosion of traditional values that are considered noble are caused by the strong currents of globalisation (Mulyono, 2017).

According to Lestari et al (2024), a curriculum that integrates local wisdom can enrich students' learning experiences through cultural values and, at the same time, support knowledge about the sustainability of their surrounding environment. Through the integration of local wisdom in learning, it is hoped that students will understand their cultural identity, appreciate local culture, and care for the surrounding environment. Although the Grade 11 learning in Geography at SMA Negeri 1 Kerjo already covers environmental material and demonstrates a fairly high level of understanding of the environment, an understanding of local wisdom needs to be integrated to strengthen local identity and knowledge as an effort to preserve and appreciate local culture.

Teachers need to play a role in integrating local wisdom into learning materials. Teachers who understand local wisdom are considered to be more effective in communicating with



students through local knowledge and can connect learning more effectively with the environmental and social realities surrounding students (Lestari et al., 2024; Pamenang, 2021). Teachers have a role to bridge local knowledge with the formal curriculum as a link between local culture and formal learning. Local wisdom-based learning attracts students' attention and builds culture-based competencies, so that teacher communication and pedagogical innovation are the keys to success (Sebayang, 2022).

According to a Study by Priyatno (2025), the strategy for overcoming the challenges of implementing local wisdom in learning is to form professional learning communities for teachers to share their experiences and best practices in implementing local wisdom-based learning. The government, as a stakeholder, needs to develop a local wisdom database that can be accessed by teachers and students as a reference source, and strengthen collaboration and cooperation between schools and local communities in identifying and documenting local wisdom practices. Thus, the integration of local wisdom, environmental education, environmental knowledge,

and attitudes towards the environment works together to produce pro-environmental behaviour.

CONCLUSIONS

Local wisdom in Kerjo District is generally related to spiritual aspects that are manifested in various traditional practices such as Bersih Desa, Nyadran, Tirakatan, and others, which aim to maintain the balance and safety of the environment and society. The implementation of local wisdom in geography lessons at Kerjo 1 Public High School is still limited due to factors such as limited learning time, teachers who are not native residents and therefore lack understanding of the local culture, and students' tendency to prefer practical learning methods using technology. Although geography lessons have integrated environmental issues through practical activities such as observation and disaster mitigation, the integration of local wisdom as cultural and spiritual values in these lessons is still not optimal. Students' sensitivity to the environment is honed through practical learning. However, the role of local wisdom as a form of environmental protection and concern, especially in the neighbourhood, needs to be enhanced in



an effort to increase understanding of the value of local wisdom as a cultural identity and a form of environmental concern.

Regarding further research directions, it is recommended that subsequent studies move beyond the analytical phase toward the development of localised Geography modules or teaching materials specifically tailored to the Kerjo context. Additionally, longitudinal research is required to assess the extent to which the integration of local values effectively transforms students' environmental preservation behaviours in their daily lives. Finally, the application of Geographic Information Systems (GIS) to map the distribution of local wisdom sites on the slopes of Mount Lawu is highly recommended to create an interactive spatial database for both educational purposes and regional planning.

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