

# Analysis of Climate Change on Flora Fauna and Community Life in Cave Kreo Tourism in Semarang City

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## ABSTRACT

The research aims to analyze climate change's effects on flora, fauna, and the socio-economic life of the community around the Goa Kreo tourist attraction. The approach used in the study is qualitative. The location of the study is at the Goa Kreo tourist attraction in Dukuh Talun Kacang, Kandri Village, Gunung Pati District, Semarang City. Data Collection Techniques are observation, interviews, and documentation. How can data be analyzed by means of data reduction, data presentation, and conclusion? Based on the results of the study, it show that climate change affects the flora, fauna, and socio-economic life of the community in Goa Kreo tourism. The increase in temperature and changes in rainfall patterns in Goa Kreo affect the existence of flora and fauna and reduce the balance of the ecosystem. The increase in temperature and the felling of trees due to the construction of the Jatibarang Reservoir have caused a reduction in wildlife habitat and socio-economic life. The decline in the number of tourists in recent years, due to increasingly hot environmental conditions and declining tourist attractions, has had an impact on the

decline in income of people who depend on the tourism sector for their livelihood.

**Keywords:** Wisata Goa Kreo, perubahan iklim, flora fauna, kehidupan sosial ekonomi

## INTRODUCTION

Pariwisata menurut Undang-Undang Republik Indonesia nomor nine tahun 1990 tentang Tourism Article 1 point 3 is "everything related to tourism, including tourist objects and attractions and related businesses in this field." The existence of tourism plays a vital role in improving the community's economy, opening up new job opportunities, promoting local cultural values, increasing regional income, and generating foreign exchange for the country. Tourism is recognized as the largest industry of this century, as seen from the development of various world indicators and employment absorption. Based on various indicators of world development in the coming year, it is predicted that the role of tourism will increase. Therefore, much needs to be done to develop tourism potential, especially in Indonesia. (Indarto et al., 2021).

Semarang City, the capital of Central Java, has a lot of tourism potential and needs to

develop a more exciting strategy to attract tourists. One is the Goa Kreo tourist attraction located in Dukuh Talun, Kandri Village, Gunungpati District. Goa Kreo nature tourism has its own uniqueness because there is an element of educational tourism in the form of nature tourism, which includes types of flora and fauna, historical tourism, and culture. This tourist attraction has its own uniqueness; it should be able to be a unique attraction for people to travel to Goa Kreo. The impact will be able to move the wheels of the economy and socio-cultural conditions, especially for the local community and government in general.

The Kreo Cave tourist attraction is a leading tourism product in Semarang, with the highest number of visits each year compared to the number of visits to other tourist attractions in Semarang (Danang Indarto et al., 2022). However, along with the rapid development of the tourism world, various regions that offer their uniqueness will undoubtedly affect the economic value of the Goa Kreo tourist area. The concept of tourism is attractively packaged in terms of the facilities offered, starting from instagramable with interesting and varied photo spots, public facilities such as toilets, places of worship, and restaurants at affordable prices, including promotions on social media, which will provide a unique attraction for tourists. In addition, tourism also really needs the importance of the basic idea of sustainable development. In order to protect and preserve the environment in tourist areas, development efforts must be made that focus not only on the development of facilities and infrastructure but also on tourist attractions that are very business-oriented or profit-oriented. However, they must also pay attention to the sustainability and preservation of nature and efforts to maintain and restore environmental functions (Fitriana, 2018).

The concept of nature tourism offered in Goa Kreo with long-tailed monkeys and various types of rare plants such as kesambi trees, peh trees, wining trees, kelayu trees, living trees, green cover trees, and so on is

very educational for visitors on how flora and fauna can be preserved for their survival. However, the construction of the Jatibarang multipurpose reservoir in the Goa Kreo area has an impact on the reduction of the hill area and the number of plants home to long-tailed monkeys.

The construction of the Jatibarang Reservoir began in September 2009 as a flood control in Semarang City, to maintain the availability of drinking water, and as a power plant. This 46.56-hectare reservoir, in addition to threatening the survival of tame wild monkeys, also submerges rice fields and productive gardens. (Enjelina & Norra, 2023).

The area of Goa Kreo is getting hotter because many trees are being cut down, causing monkeys who should depend on nature for their lives to now depend on human provision for food in order to survive and remain sustainable. Goa Kreo tourism continues to experience a drastic decline in the number of tourists because people prefer newer and more exciting tourist attractions that offer more complete facilities.

Research reference conducted by Edy, Mulyo, and Darwanto entitled "Benefits of Kreo Cave and Jati Barang Reservoir Tourism for the Economy and Community Environment." Examining the impact and utilization of the potential of Kreo Cave and Jatibarang Reservoir for the economy and community environment. This study states that the existence of Kreo Cave and Jatibarang Reservoir tourism has an impact on the surrounding community, especially in the economic and social sectors such as community income, opening up business opportunities, community culture, and the physical environment (Edy et al., 2017). In addition, research conducted by (Amarrohman et al., 2018), "Study of Tourist Location Attractions Based on the Economic Value of the Area in Semarang City," with tourist attractions in the Old City Area of Semarang and Goa Kreo Semarang which are located differently. Based on the research that has been done, the attraction of tourists visiting tourist attractions is

influenced by the ease of access to the location of the existing tourist attractions; the easier it is to reach, the more tourists will visit. Based on the economic value of the area obtained, it can be identified that the cheaper the cost incurred to reach a tourist attraction, the more tourists will visit it.

The community's wishes regarding the tourist attraction will also try to maintain it. The local government will continue to develop existing tourist attractions by looking at the potential of the tourist attraction.

Some of these studies still need to be developed, especially in the study of Goa Kreo tourism from the social and geographical aspects of various changes that occurred during 2024. Based on the description above, the author wants to study how climate change and the construction of the Jatibarang multipurpose reservoir affect the biodiversity in Goa Kreo and the economic life of the surrounding community, which depends on the tourism sector in Goa Kreo. This study aims to analyze climate change's effects on flora and fauna and the socio-economic life of the community around the Goa Kreo tourist attraction.

## MATERIALS & METHODS

The research location is at the Kreo Cave tourist attraction in Talun Kacang hamlet, Kandri sub-district, Gunung Pati district, Semarang city.



**Image: 1** Location of Semarang City  
Source: <https://batas-admin.geoit.dev/>



**Image: 2** Location of Kandri Village, Gunungpati District, Semarang City

Source: <https://batas-admin.geoit.dev/>

This study uses a qualitative approach. Data collection techniques in this study are observation, interviews, and documentation. Observation techniques are used to observe tourist objects, to find out the situation directly and conditions of Goa Kreo tourism, and the context in data collection (Satori & Komariah, 2010). This interview aims to gain an understanding of the changes that occur in the flora and fauna around Goa Kreo and how these changes affect the social, economic, and cultural activities of the local community. Documentation techniques are used to collect supporting data, such as photos and historical records, that can provide an overview of the condition of the ecosystem. Data analysis in the study includes data reduction, data presentation, and conclusion. Data from interviews and observations are filtered to find important information related to changes in flora and fauna and the lives of people in Goa Kreo.

## RESULT & DISCUSSION

### A. Climate Change on Flora and Fauna of Goa Kreo

Climate change is a change in physical conditions in the Earth's atmosphere, such as air temperature and rainfall, which significantly impact various human life activities. Climate change is a global issue that requires joint efforts from all countries to reduce greenhouse gas emissions and adapt to the impacts of climate change (Sunarmi et al., 2022).

Climate change refers to long-term changes in global weather patterns, including

temperature, rainfall, and wind. These changes can occur naturally. Currently, human activities are the main factor driving climate change. The rate of climate change now exceeds all-natural variations in the last 1000 years. An essential aspect of life that is threatened by climate change is flora and fauna. Climate change has a significant impact on flora and fauna around the world. These impacts can occur directly or indirectly and threaten species' survival and ecosystem functions. (Surakusumah, 2013)

The flora in Goa Kreo is dominated by typical tropical vegetation, especially plants that thrive in mountainous and forest environments. Teak trees (*Tectona grandis*) are one of the types of trees that are widely found around this area, having economic and ecological value because of their solid and durable wood. In addition, mahogany trees (*Swietenia macrophylla*) also grow in Goa Kreo and are known to absorb air pollution well. Bamboo (*Bambusoideae*) is often found in this area, functioning as an erosion barrier and protecting local fauna. In addition to large trees, Goa Kreo is filled with various shrubs and bushes that provide habitat for small animals. (Tutik Tutik, 2022).

Flora and fauna can be affected by climate change through some complex mechanisms, including habitat changes. In many ecosystems, rising global temperatures have significantly altered rainfall and temperature patterns. For example, in tropical forests, these changes can cause changes in the composition and structure of primary vegetation, such as large trees that can survive in hot and humid environments, which can have a very significant impact on biodiversity. (Darmawan, 2024).

#### ***a. The direct impact of climate change on flora and fauna in Goa Kreo***

The average air temperature in Gunungpati District is 28.9°C. Temperature increase, also known as global warming, refers to the increase in the average temperature of the earth's surface in the long term. This phenomenon is one of the main impacts of climate change caused by human activities,

especially greenhouse gas emissions. Increasing air temperatures can cause heat stress in species, especially those sensitive to temperature changes. This can lead to population declines, behavioral changes, and even death in some species.

Causes of Temperature Increase include Greenhouse Gases. Greenhouse gases, such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O), absorb heat from the sun and hold it in the atmosphere, causing global warming. These greenhouse gas emissions mainly come from burning fossil fuels, deforestation, and industrial activities. (Legionosuko et al., 2019). Furthermore, there is the Feedback Effect. Increasing temperatures can trigger feedback effects that worsen warming. For example, melting ice at the poles reduces the reflection of sunlight so that the earth absorbs more heat.

The climate conditions of the Goa Kreo Semarang tourist attraction, with a climate classification according to Schmidt and Ferguson, Gunungpati District (Goa et al.) is included in the type C climate with a rather wet nature and an air temperature of 28.9°C (Ayu Septiyana, 2022). Changes in rainfall patterns are one of the main impacts of climate change that significantly impact biodiversity. These changes can be in the form of increased or decreased rainfall, changes in the intensity and frequency of rain, and changes in the rainy and dry seasons. Prolonged drought due to changes in rainfall patterns can cause water shortages for plants and animals, leading to population declines, behavioral changes, and even death. Increased rainfall or extreme flooding can also cause habitat destruction, species loss, and changes in community structure.

Changes in rainfall patterns can disrupt nutrient cycling in ecosystems, affecting productivity and biodiversity. It can also cause shifts in species distributions, both geographically and vertically. Species may migrate to wetter areas or higher elevations to escape the adverse effects of climate change.

**b. Changes in the Distribution and Interaction of Flora and Fauna in Kreo Cave**

Climate change can cause shifts in the distribution of flora and fauna, both geographically and vertically. Flora and fauna that used to gather around the hills in the western area of Goa Kreo now migrate or move to the eastern area of the tourist attraction because the eastern area of the tourist attraction has a higher altitude and to avoid the adverse effects of climate change and ensure that the monkeys get food from tourists who visit.

Changes in the distribution of flora and fauna refer to changes in a species' geographical location or location due to changes in environmental conditions, especially those related to climate change. As a result of changes in distribution, species can migrate to new, more suitable areas that offer better conditions for survival, or their populations can shrink or disappear altogether if they are not strong enough to survive. The impacts that cause changes in species distribution are habitat loss and ecosystem imbalance.

The factor of changing species interactions is climate, which not only has a direct impact on species but also causes spatial interactions to be damaged. One example of how climate change can change species interactions is competition. Climate change can change the availability of resources for species, causing increased competition for them. For example, drought increases competition for water content and plant fertility for herbivorous wild animals.

The impact of climate change can affect the flora and fauna of Goa Kreo, such as wildlife (monkeys and other animals), which directly and indirectly threatens the survival of species and the overall function of the ecosystem. It is essential to make mitigation and adaptation efforts to reduce the impact of climate change on biodiversity in Goa Kreo. Mitigation efforts aim to help species and ecosystems adapt to climate change. The Goa Kreo tourist attraction is a leading tourist attraction in the city of

Semarang, one of which from Semarang is the long-tailed macaque (*Macca fascicularis*), which lives freely and is tame because it is used to interacting with humans in the Goa Kreo tourist area which is a collection of fauna in the tourist attraction.

**B. Socio-Economic Life of the Community Around the Kreo Cave Tourism**

The community at the Kreo Cave tourist site are residents of Talun Kacang Hamlet, Kandri Village, Gunungpati District, which has a population of:

| No     | Population        | Year 2023 |
|--------|-------------------|-----------|
| 1      | Male Population   | 2.498     |
| 2      | Female Population | 2.466     |
| Amount |                   | 4.964     |

**Table 1 Population of Kandri Sub-district**  
Source: (Central Statistics Agency, 2023)

Pada table 1 dapat dilihat bahwa jumlah population by gender male and female, the number of males in 2023 is 2,498, and the female population is 2,466. So, the number of males and females is 4,964 in 2023.

Social life is a life that is marked by the presence of social elements of society, that is what is called social life in this case social life, which can be seen from how social interactions with social activities such as cooperation, community service, helping each other, helping in certain activities, and others. (Pokhrel, 2024) The Talun Kacang Hamlet community is a village community that maintains social and cultural values . The community still maintains social values such as tolerance and cooperation around tourist attractions (Marsela & Wijaya, 2020).

**a. Interaction between the community and tourists at the Kreo Cave tourist attraction**

The interaction between the community and tourists at the Goa Kreo tourist destination significantly enriches insight and strengthens local cultural identity. Tourists from various regions, even outside Java,

bring new cultures, views, and values that make the community around the Goa Kreo tourist area learn things different from their own culture. The interaction between tourists and the community in the context of cultural tourism is a significant learning tool for both parties. Tourists learn about local culture, while the community gains insight into foreign cultures. This helps broaden the cultural insights of local communities and improve cross-cultural understanding. (Nguyen et al., 2020)

### **b. Mutual Cooperation in Tourism Management**

Cooperation or collective cooperation in society is one aspect of social capital necessary for tourism management. (Ramkissoon and Mavondo 2020). Also, Harilal et al. (2020) state that cooperation is essential in regulating and maintaining tourism security in natural tourism areas. In this case, the community around Goa Kreo generally has an important role, especially in cooperation, such as maintaining cleanliness and tourist facilities. Many communities around Goa Kreo tourism provide signs for visitors to maintain the cleanliness of tourism when visiting. This participation helps keep the tourist environment well-maintained and comfortable for visitors. Cooperation is also seen in community activities or traditions that involve residents. One of the traditions usually carried out by the community in Goa Krea is the Sesaji Rewanda parade tradition.



**Image: 3 Rewanda Carnival Ceremony**  
Source: Internet.

Kirab Sesaji Rewanda combines two meanings: Sesaji, which means gift, and

Rewanda, which means monkey. According to community leaders in Talun Kacang hamlet, Kirab Sesaji Rewanda is a traditional tradition that gives gifts to the monkeys that guard Goa Kreo. Sesaji Rewanda is held to honor the monkeys preserving the forest around Goa Kreo. This Kirab aims to raise public awareness about the importance of environmental preservation because forests are an asset in maintaining the sustainability of the ecosystem. (zahra rizkia et al., 2022).

Kirab Sesaji Rewanda is an implementation of the ancestral customs of the original residents of Talun Kacang RW 03, Kandri Village, namely Nyadran Goa, which has been carried out since ancient times before Goa Kreo was known as a tourist spot as it is today. (Cahyani et al., 2023). In addition, the Goa Kreo tourist attraction also impacts increasing social status, where people who used to work only as traditional farmers or laborers now have a new status as traders—the number of businesses in the Goa Kreo tourist area. From the results of observations on October 6, 2024, the number of stalls in Goa Kreo was 45 stalls, with various types of businesses ranging from Food and Beverage Traders, Souvenirs and Souvenirs, Fruit, Children's Toys, Photo Services and Photo Souvenirs, Accessories and Outdoor Equipment and many others.

Tourist attractions will indirectly have a positive impact on the economy, especially on regional income and local community income. In this case, developing tourist attractions opens up many business opportunities, so many workers are involved. The main goal of developing a tourist attraction is to improve the economic welfare of the surrounding community. (Cahyani et al., 2023). Kreo Cave Tourism is one of the tourism developments located in Dukuh Talun Kacang, Kandri Village, Mijen District, Semarang, Central Java.

Kreo Cave Tourism has various attractions, making it an exciting tourist destination. In addition to its natural beauty and unique history, Kreo Cave also has a strong cultural appeal.

a) Cave



**Image: 4 Goa Kreo**  
**Source: Personal Documentation**

Goa Kreo merupakan goa yang dikaitkan dengan legenda Sunan Kalijaga, salah satu Wali Songo yang diyakini pernah singgah di Goa Kreo saat sedang mencari kayu jati untuk pembangunan Masjid Agung Demak. Menurut cerita dari salah satu petugas wisata Goa Kreo, bapak teguh. Sunan Kalijaga bertemu dengan sekelompok monyet yang menjaga goa, yang hingga saat ini masih dianggap sebagai "penjaga" Goa Kreo. Mitos ini membuat Goa Kreo memiliki daya tarik spiritual dan budaya yang kuat, menarik wisatawan yang penasaran dengan sejarah dan cerita rakyat setempat.

b) Wild Monkey Colony



**Image: 5 Monkey Statues**  
**Source: Personal Documentation**

The unique attraction of Goa Kreo is the presence of a colony of monkeys that live freely around the cave and tourist area. These monkeys are entertainment for visitors, and visitors can interact directly with them. Tourists are usually warned to be careful with their belongings, but the presence of these monkeys adds to the unique tourist attraction. The Goa Kreo tourist area has hundreds of monkeys of the *Macaca fascicularis* ethnic group, or long-tailed monkeys, which are the legend behind the name Goa Kreo. The exciting part of this

place is that tourists will pass through several steps to see the natural beauty directly, such as a vast lake that can soothe visitors' eyes.



**Image: 6 Steps**  
**Source: Internet**

These steps are access to the cave. This place can also be an exciting photo spot that provides a beautiful view of the surrounding hills. Before the construction of the Jatibarang Reservoir, the hill was a place for the monkeys to live, and it was integrated with the surrounding area. However, after the reservoir was filled with water, the hill looked like a small island. Monkeys usually take shelter in the cave area when it rains. The cave has a vast room at the mouth of the cave and becomes narrower as you explore the inside. Even tourists who explore the cave must crouch to reach the end, where a monkey statue exists. A myth has developed from this tourist spot that the end of the cave can reach Lawang Sewu. Then, visitors can continue their journey up the hill, a sloping land with many monkeys. Tourists must be careful with their belongings because monkeys can attack aggressively.

Kreo Cave tourism certainly impacts the order of life of the surrounding community, especially in terms of the economy. The community's economic life is influenced mainly by the tourism and agricultural sectors. Over time, Kreo Cave tourism has become increasingly known by most local and non-local people. In this case, the existence or number of tourist visits to Kreo Cave will undoubtedly open up opportunities for the surrounding community to carry out business activities by providing various kinds of tourist needs while visiting the Kreo Cave tourist location

(Untan et al., 2019). The increase in tourists has had various impacts on the surrounding community's economy (Cahayani et al., 2023). Among them are the growth of small and medium enterprises (MSMEs).

#### **a. Small and Medium Enterprises (SMEs)**

MSMEs, Micro, Small, and Medium Enterprises, are businesses owned and operated by individuals or groups on a small to medium business scale. MSMEs refer to business activities formed by citizens, either in the form of private businesses or business entities. (Aliyah, 2022). MSMEs, such as micro, small, and medium enterprises, have an essential and strategic role in national economic development. In addition to playing a role in economic growth, they also play a role in absorbing labor. (Windusancono, 2021).

Developing micro, small, and medium enterprises (MSMEs) is a magnificent process that brings a nation and country towards prosperity. (Wika & Anggia, 2021). In this case, MSMEs in the Goa Kreo tourist area have an essential role in supporting the community's economic growth around the Goa Kreo tourist area. The MSMEs in this area are food, drink, souvenirs, and local craft kiosks sold by the Dukuh Talun Kacang Community, Kandri Village. Along the road to Goa Kreo tourism, there are many types of businesses established by local people and outsiders, such as food traders, beverage traders, accessories traders, and various souvenirs typical of Goa Kreo that can be purchased. With this, the people around Goa Kreo benefit from the arrival of tourists by opening kiosks or outlets selling local souvenirs. Products such as snacks, handicrafts, Goa Kreo-themed souvenirs, and local cultural products such as batik are the mainstay of MSMEs. With the presence of tourists, demand for these products increases, thus encouraging the growth of MSMEs in the surrounding community.

#### **b. Provision of tour guide services**

Kreo Cave has unique attractions and economic values, from history, legends, and natural beauty to its wildlife. With tourism development in this area, the surrounding community can benefit directly from their various services. (Marsela & Wijaya, 2020). This service provides information and creates added value for tourists during their visit. Tour guides in Kreo Cave often provide detailed explanations about the legend of Sunan Kalijaga, who is believed to have stopped by this cave. They can also tell stories about long-tailed monkeys who are considered cave guardians. This information helps visitors understand the historical and spiritual background of this area. In addition to the famous long-tailed monkeys in Kreo Cave, tour guides will also provide information about the biodiversity around Kreo Cave. Visitors who are interested in ecotourism can get a better understanding of the local flora and fauna. In addition, guides often know the best locations to take pictures of beautiful scenery and suspension bridges. They can recommend interesting spots that visitors might not know without guidance. Some guides even offer professional photography services or help tourists to get the perfect picture. This can impact the prosperity of the community around the area and greatly help the community around the tourist area. The various activities in the tourist area open up opportunities for the community in the economic sector. However, the construction of the Jatibarang multipurpose reservoir in the Goa Kreo area has reduced the area of hills and the number of plants home to long-tailed monkeys. The construction of the Jatibarang Reservoir began in September 2009 as flood control in Semarang, maintaining the availability of drinking water and as a power plant. The Jatibarang Reservoir has an area of around 46.56 hectares; in addition to threatening the survival of wild monkeys that are already tame, it also submerges rice fields and productive gardens. This condition makes the Goa Kreo area even hotter because



many trees have been cut down; this makes monkeys, who depend on nature for their survival, depend on human assistance to get food to survive and reproduce. This condition can affect tourist visits because the weather is getting hotter, and long-tailed monkeys are increasingly invisible. This condition makes tourists reluctant to visit. Tourist visits to the Goa Kreo tourist area have been decreasing. From observations on October 6, 2024, the results of an interview with one of the Goa Kreo tourist officers, Mr. T, he said.

*"Since 2022, quite a lot of tourists have come here, with a weekly figure of 1,319, and in 2023 it was recorded at 1,264, and in 2024 an average of 1,150 tourists."*

From the above explanation, it can be concluded that the climate conditions in the Kreo Cave tourist area influence the level of tourist visits. This can impact the income of the community around Kreo Cave, especially the community that depends on the tourism sector.

## CONCLUSION

Rising temperatures and changing rainfall patterns have impacted the ecosystem of Goa Kreo. Rising temperatures and deforestation have reduced the habitat of flora and fauna, including long-tailed monkeys, which depend on the environment for survival. This has made wild animals (monkeys) solely dependent on human assistance.

Socio-economically, Goa Kreo tourism has positively impacted the local economy through increased income from small businesses, such as food stalls, souvenir sales, and tour guide services. However, with the decline in tourist attractions due to environmental changes, there has been a decline in the number of visitors, affecting the income of people who depend on this tourism sector.

**Declaration by Authors**

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## REFERENCES

1. A, Ibrahim, M. 2015. Qualitative Research Methodology. Alfabeta: Bandung.
2. Aan Komariah and Djam'an Satori. 2010. Qualitative Research Methodology Bandung: Alfabeta
3. Aliyah, A. H. (2022). The Role of Micro, Small and Medium Enterprises (MSMEs) in Improving Community Welfare. *Welfare Journal of Economics*, 3(1), 64–72. <https://doi.org/10.37058/Wlfr.V3i1.4719>
4. Amarrohman, F. J., Awalludin, M., & Subiyanto, S. (2018). Study of the Attractiveness of Tourist Locations Based on Regional Economic Values in Semarang City. *Elipsoida*, 02(02), 7–11.
5. Ayu Septiyana, B. (2022). Geographical Review of the Kreo Cave Tourism Area in Semarang. *Geo Image*, 11(1).
6. Central Statistics Agency. (2023). Semarang City Central Statistics Agency. Central Statistics Agency, 5–6.
7. Cahayani, Fadila Cita, Rafidah, A., Naja, A., Anabella, V., Apriliano Putra, C. J., Yudhayono Sihombin, I. A., & Afifah, Lalu Zalfa. (2023). Analysis of the Utilization and Attraction of Kreo Cave as a Tourist Destination in Semarang City. *Jurnal Majemuk*, 2(4), 560–567.
8. Darmawan, M. J. (2024). The Impact of Climate Change on Biodiversity: Challenges and Mechanical Engineering Study Programs. 4(2), 113–119.
9. Enjelina, L., & Norra, B. I. (2023). Long-Tailed Monkey (*Macaca Fascicularis*) Behavior in Goa Kreo Semarang Tourism Object Analysis of Morphological Structure, Anatomy of Extremities, and Behavior of Long-Tailed Monkeys (*Macaca Fascicularis*) in Goa Kreo Semarang. *Journal of Biological Education and Science*, 6(1), 29–37. <https://doi.org/10.33323/Indigenous.V6i1.358>
10. F. J. Amarrohman, M. Awaluddin, and S. Subiyanto, (2018). "Study of Tourist Location Attractiveness Based on Economic Value of Area in Semarang City," *Elipsoida: Journal of Geodesy and Geomatics*, Vol. 2, No. 02, Pp. 7–11, Nov. 2019. <https://doi.org/10.14710/Elipsoida.2019.6439>
11. Gunanto, E. Y. A. (2022). Peer Review Drs. Edy Yusuf Agung Gunanto, M. Sc., Ph. D: Benefits of Kreo Cave Tourism and

- Jatibarang Reservoir for the Economy and Community Environment (Empirical Study: Kandri Village, Gunung Pati District, Semarang City).
12. Harilal, V., Sumanapala, D., & Nandasena, P. (2020). "Community Involvement And Environmental Conservation In Tourism: A Study On Nature-Based Tourism In Sri Lanka." *Journal Of Environmental Planning And Management*, 63(9), 1535-1554. <https://Nasional.Kompas.Com/Read/2011/03/09/08372078/~Regional~Jawa>
  13. Indarto, D., Waskito, W., & Sari, S. N. (2021). Development of the Potential of the Kreo Cave Tourism Object in Semarang During the Covid-19 Pandemic. *Indonesian Journal of Geography Education*, 2(2), 72-82.
  14. Legionosuko, T., Madjid, M. A., Asmoro, N., & Samudro, E. G. (2019). Indonesia's Position and Strategy in Facing Climate Change in Order to Supporting National Resilience. *Journal of National Resilience*, 25(3),295.<https://doi.org/10.22146/jkn.50907>
  15. Marsela, A. S., & Wijaya, A. (2020). The Impact of the Development of the Kreo Cave Tourism Object on the Welfare of the Community Who Lost Their Livelihoods. *Solidarity: Journal of Education, Society and Culture*, 9(1), 848–856.
  16. Mestika Zed. (2023). *Literature Research Methods*. Yayasan Pustaka Obor Indonesia, pp. 1-2.
  17. Nguyen, T. H., Cao, T. H., & Truong, D. D. (2020). "Cultural Learning Through Tourism: Host-Guest Interaction in Rural Areas." *International Journal of Cultural Heritage*, 22(3), 45-60.
  18. Pokhrel, S. (2024). The Pulau Pisang Tourism Object in Improving the Socio-Economic Life and Socio-Religious Life of the Community of Pulau Pisang District, Pesisir Barat Regency. *Ayan*, 15(1), 37–48.
  19. Ramkissoon, H., & Mavondo, F. T. (2020). "Social Capital, Community Attachment, And Support For Sustainable Tourism Development." *Journal Of Sustainable Tourism*, 28(2), 286-306.
  20. Sunarmi, N., Kumailia, E. N., Nurfaiza, N., Nikmah, A. K., Aisyah, H. N., Sriwahyuni, I., & Lailly, S. N. (2022). Analysis of Weather Element Factors on Climate Change in Pasuruan Regency in 2021 Using the Principal Component Analysis Method. *Newton-Maxwell Journal Of Physics*, 3(2), 56–64. <https://doi.org/10.33369/Nmj.V3i2.2338>
  21. Surakusumah, W. (2013). Climate Change and Its Impact on Biodiversity. *Indonesian Journal of Education*, 1–24.
  22. Tutik Tutik. (2022). The Role of Government in Developing the Kreo Cave Tourism Object. *Journal of Management Vision*, 8(3), 176–187. <https://doi.org/10.56910/jvm.V8i3.232>
  23. Untan, D., Gunanto, E. Y. A., Hendarto, M., & Darwanto, D. (2019). Benefits of Kreo Cave Tourism and Jatibarang Reservoir for the Economy and Community Environment (Empirical Study: Kandri Village, Gunung Pati District, Semarang City). *Economic and Management Media*, 32(2), 119–136. <https://doi.org/10.24856/Mem.V32i2.512>
  24. Wika, U., & Anggia, S. L. (2021). Micro, Small and Medium Enterprises (MSMEs) in Improving Community Welfare. *Journal of Social Humanities Education Research*, 6(1), 32–38. <https://doi.org/10.32696/Jp2sh.V6i1.702>
  25. Windusancono, B. A. (2021). Efforts to Accelerate the Growth of Micro, Small and Medium Enterprises (MSMEs) in Indonesia. *Administration Forum, Faculty of Social and Political Sciences, Untag Semarang*, 18(2), 32. <https://doi.org/10.56444/Mia.V18.2.2528>
  26. Zahra Rizkia, P., Josue William, A., Narindra Indah, P., Liona Surya, P., Lailatus, S., An dhina Putri, H., & Trida Ridho, F. (2022). Forms of Local Wisdom in Environmental Management Around Jatibarang Reservoir, Semarang City. 223–232.

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