



summer school
Geoconservation of Kebumen Geopark

GERAKAN 1000 ARTIKEL

- SPECIAL EDITION -

*Summer School on Kebumen UNESCO Global
Geopark Geoconservation 2026*

Editorial Board

Susunan Tim Redaksi

Advisory Board / Pengarah

Haryono Wahyudi, S.T., M.T — Acting Head of Bapperida, Kebumen Regency / *Pelaksana Tugas Kepala Badan Perencanaan Pembangunan, Riset dan Inovasi Daerah Kabupaten Kebumen*

Person in Charge / Penanggung Jawab

Krima Karmila, S.Sos., M.Eng — Secretary of Bapperida, Kebumen Regency / *Sekretaris Badan Perencanaan Pembangunan, Riset dan Inovasi Daerah Kabupaten Kebumen*

Chief Editor / Ketua Penyunting

Ika Fitriani, S.Si., M.Sc — Head of Regional Research and Innovation Division Bapperida, Kebumen Regency / *Kepala Bidang Riset dan Inovasi Daerah Bapperida Kabupaten Kebumen*

Managing Editors / Koordinator Penyusunan

Astin Nurdiana S.T., M.Sc., Ph.D — Institut Teknologi Bandung
Khusnul Prasetyo, S.AP., M.PP — Universitas Sebelas Maret

Editors / Editor

Aulia Ni'matu Fajar, S.H., M.H — Bapperida Kebumen Regency
Rizki Rahmawati, S.Stat — Bapperida Kebumen Regency
Khusnul Prasetyo S.AP., M.PP — Universitas Sebelas Maret

Layout Designers / *Penata Letak*

Rizki Rahmawati, S.Stat

Ligar Amellea Razuanur

Cover Designer / *Desain Sampul*

Arin Syafingatulazizah

Contributors / *Kontributor*

Participants of the Summer School on Kebumen UNESCO
Global Geopark Geoconservation 2026 / *Peserta Summer
School on Kebumen UNESCO Global Geopark Geoconservation
2026*

Foreword from Acting Head of Bapperida, Kebumen Regency

We give thanks to Allah SWT for His abundant mercy, guidance, and blessings, which have enabled the successful completion of this book, *Gerakan 1000 Artikel Special Edition Summer School on Kebumen UNESCO Global Geopark Geoconservation 2026*.

This book is one of the key outcomes of the Summer School on Kebumen UNESCO Global Geopark Geoconservation, held from May 3–12, 2026. The program was jointly organized by Sebelas Maret University and the Bandung Institute of Technology in collaboration with the Kebumen Regency Government. This program served as a platform for learning, knowledge exchange, and collaboration to deepen understanding of geoconservation and the importance of preserving geological heritage in support of sustainable development. The articles presented in this book are the result of the participants' thoughts, reflections, and experiences during the Summer School program, which covered various themes related to geology, geoconservation, geotourism, biodiversity, culture, and community empowerment in the Kebumen UNESCO Global Geopark area.

We extend our deepest appreciation and gratitude to all participants, speakers, academics, organizers, and everyone who contributed to the success of the Summer School and

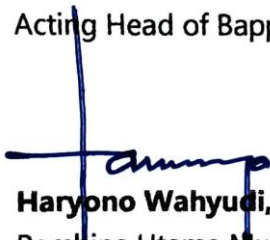
the compilation of this book. The synergy that has been forged is clear evidence perserving of geological heritage requires collaboration among various stakeholders.

We hope this book will serve as a reference, a learning resource, and a source of inspiration for academics, students, government officials, the public, and geopark enthusiasts to continue developing their knowledge and commitment to geoconservation. May this publication help strengthen conservation efforts for the Kebumen UNESCO Global Geopark and foster innovation and collaboration in the sustainable management of geoparks.

We recognize that this book still has various limitations. Therefore, we greatly welcome constructive criticism and suggestions to help improve future editions.

Kebumen, July 2026

Acting Head of Bapperida, Kebumen Regency



Haryono Wahyudi, ST, MT.

Pembina Utama Muda (IV/c)

NIP. 197401261999031004

Foreword from Head of the Geological Engineering Study Program Institut Teknologi Bandung

We give thanks to God Almighty for the successful implementation of the Summer School on Kebumen UNESCO Global Geopark Geoconservation, which provided a valuable platform for learning, knowledge exchange, and collaboration among participants from diverse academic and professional backgrounds. The programme offered a unique opportunity to explore the Kebumen UNESCO Global Geopark not only as an area of remarkable geological heritage, but also as a living landscape where geology, the environment, culture, and local communities are closely interconnected.

For geological education, field-based learning plays an essential role in developing a deeper understanding of the Earth and its processes. Direct observation of rocks, landscapes, geological sites, and community activities provides experiences that cannot be fully replicated in the classroom. Through this Summer School, participants were encouraged to explore how geoscience can contribute to geoconservation, community development, and sustainable development.

As part of the programme, participants were given the opportunity to share their observations, experiences, and perspectives through short articles. These contributions have been compiled in Gerakan 1000 Artikel – Special Edition:

Summer School on Kebumen UNESCO Global Geopark Geoconservation. This publication serves not only as a record of the participants' learning journey, but also as a platform for sharing the knowledge and experiences gained throughout the programme with a wider audience.

The articles presented in this special edition reflect a diversity of perspectives while highlighting an important understanding: a geopark is not solely about geology. It is a living landscape where scientific knowledge, cultural heritage, local communities, and conservation efforts come together and enrich one another.

We hope that this publication will serve as more than a record of the Summer School. May the ideas and experiences presented in these articles broaden readers' perspectives, deepen their appreciation of geological and cultural heritage, and inspire young people to take an active role in geoconservation and sustainable development.

On behalf of the Geological Engineering Study Program, Institut Teknologi Bandung, I would like to express my sincere appreciation to all participants for their enthusiasm, active engagement, and valuable contributions throughout the programme. I would also like to extend our gratitude to Universitas Sebelas Maret, the Government of Kebumen Regency, and all partners, institutions, and local communities whose support and collaboration contributed to the success of this programme.

May the spirit of learning from the Earth, engaging with communities, and preserving our shared heritage continue to inspire future generations.

Bandung, July 2026

Head of the Geological Engineering Study Program

Institut Teknologi Bandung,



Dr. Idham Andri Kurniawan S.T., M.T

Lektor (III/c)

NIP: 119110007

Foreword from Dean of the Faculty of Social and Political Sciences Universitas Sebelas Maret

We are grateful to Almighty God for the publication of *Gerakan 1000 Artikel: Special Edition Summer School on Kebumen UNESCO Global Geopark Geoconservation 2026*. This book represents one of the important outputs of the Summer School jointly organized by Universitas Sebelas Maret, Institut Teknologi Bandung, and the Government of Kebumen Regency.

For Universitas Sebelas Maret, this Summer School represents an important learning model that bridges theoretical knowledge with field experience. Through seminars, discussions, geosite visits, and engagement with local communities, participants learned about geoconservation and its connections with governance, culture, community empowerment, and sustainable development.

It would be unfortunate if the knowledge, experiences, and ideas generated during the program remained merely as archives, photographs, or personal memories. We believe that the participants have valuable reflections and ideas that deserve to be developed into written works. This book provides a platform through which those ideas can be documented and shared with a wider audience.

On behalf of the Faculty of Social and Political Sciences, Universitas Sebelas Maret, we express our sincere appreciation to the Regional Development Planning, Research and Innovation Agency of Kebumen Regency (Bapperida Kabupaten Kebumen), for facilitating the publication of the participants' works. Our appreciation also goes to Institut Teknologi Bandung, the Government of Kebumen Regency, the speakers, academic mentors, editorial team, and all participants who contributed to the program.

We hope that this collaboration will continue to develop through learning activities, research, publications, and community engagement. May this partnership continue to provide a space for younger generations to create, learn, exchange ideas, and grow together.

Surakarta, July 2026

Dean of the Faculty of Social and Political Sciences
Universitas Sebelas Maret,



Dr. Didik Gunawan Suharto, S.Sos., M.Si.

Pembina Utama Muda (IV/c)

NIP. 197411072003121001

Table of Contents

Editorial Board.....	i
Foreword from Acting Head of Bapperida, Kebumen Regency.....	iii
Foreword from Head of the Geological Engineering Study Program Institut Teknologi Bandung.....	v
Foreword from Dean of the Faculty of Social and Political Sciences Universitas Sebelas Maret.....	viii
Table of Contents.....	x
1 Learning, Culture, and Friendship at Kebumen Geopark Geoconservation 2026.....	1
2 Dream, Connecting, and Exploring: My Summer School Experience at Kebumen UNESCO Global Geopark.....	5
3 My Experience at the Kebumen UNESCO Global Geopark Summer School 2026.....	8
4 Summer School Geoconservation on Kebumen Geopark.....	11
5 A Piece of the Earth, a Piece of Me: My Time at Kebumen Geopark.....	14
6 Discovering The Natural Origins of Dental Materials	16
7 Refleksi dan Pembelajaran dari Summer School Kebumen UGGp: Manfaat Geologi, Geopark, dan Catatan Penyempurnaan Kegiatan	19
8 My Learning Experience Through the Summer School Program.....	23
9 Exploring Geocotourism and Geoconservation in Kebumen Unesco Global Geopark.....	26
10 A Week in Kebumen: Geology, Culture and Memories from Kebumen Geopark Summer School 2026	29

11	From Ancient Abysses to Sustainable Fibers: A Journey Through Kebumen UGGp.....	32
12	The Allure of Diversity at the Kebumen UNESCO Global Geopark as a Sustainable Tourism Destination.....	42
13	Exploring Geological Heritage and Geosites at Kebumen UNESCO Global Geopark.....	45
14	Beyond the Rocks: Reflections on Geology, Economy, and Sustainable Development in Kebumen Geopark.....	50
15	Unearthing Kebumen Summer School Kebumen 2026!..	53
16	Walking Through Earth's History: My Journey in Kebumen UNESCO Global Geopark.....	54
17	Kebumen Geopark Through a Sustainability Lens	55
18	My Takeaway: Why Kebumen Geopark Matters More Than I Expected	57
19	Summer School 2026 Article	59
20	Experiences Visiting Kebumen UGGp and Learning Experiences throughout The Summer School	62
21	Kebumen Tourism Loop: Merangkai Potensi Indikasi Geografis melalui Jalur Wisata Terpadu.....	64
22	Dari Sekadar Informasi Menuju Pengalaman: Pengembangan Website Geopark Kebumen.....	70
23	Turtle Journey: Inovasi Digital Adopsi Simbolis Penyu Berbasis Konservasi dan Eduwisata dalam Mendukung Pariwisata Berkelanjutan di Geopark Kebumen	79
24	GeoTrack Karangsembung : Pengembangan Wisata Berbasis Edukasi Geosite di Geopark Kebumen	85
25	Augmented Reality for Sustainable Geotourism: Transforming Visitor Engagement at Kebumen Geopark.....	98
	Appendix A Photographic Documentation	108

Appendix B Posters	116
--------------------------	-----

Learning, Culture, and Friendship at Kebumen Geopark Geoconservation 2026

Abdurrazaq

Undergraduate Program Geology, Universitas Indonesia

As a student at Universitas Indonesia, I feel that meeting and exchanging ideas with international students is something very important. Through conversations and shared experiences, I can learn new perspectives, improve my understanding, and broaden my knowledge beyond what I usually get in class. That is why the Geoconservation Summer School at Kebumen Geopark became such a meaningful experience for me. This program was not only about geology, but also about connecting local students with people from different countries and introducing Indonesian culture, especially the richness of Kebumen, to the international community.

On the first day, I met my roommates: Edi, Aidil, and Erfin. Honestly, at first I thought they were quiet and maybe a bit difficult to approach, so I did not talk much during the first day. But on the second day everything started to feel different. I slowly became closer with many participants and started introducing myself to students from Azerbaijan, Palestine, Pakistan, Japan, and Malaysia. At first, I thought international students might not really want to interact with local students like me, but it turned out they were all very friendly and open minded. Some of them could even speak Indonesian, which surprised me and made me really happy.

That day we also attended symposium sessions from many speakers as the opening of the summer school program.

The third day was probably one of the most memorable days for me because we visited several geosites in Karangsambung. The first place we visited was the BRIN campus. What caught my attention the most was the rare rock collection, especially metamorphic rocks like eclogite and jasperoid breccia. Seeing those rocks directly was something I rarely experience. After that, we visited the serpentinite geosite. During the explanation, Prof. Dr. Ir. Emmy Suparka, IPU from Institut Teknologi Bandung explained how serpentinite formed through subduction processes involving water. She also explained that serpentinite has a unique texture similar to snake skin, which made the discussion even more interesting.

We then continued to the Cangkring geosite. I noticed different colors in the claystone layers there. The green color indicated chlorite minerals, the red color was related to iron oxide minerals, and the yellowish color represented weathering processes. After that, we visited Watukelir. According to Pak Alfend, Watukelir is interesting because it has interbedded chert and limestone layers, with pillow lava above them. It clearly shows how complex the geology of the area is.

The last geosite we visited that day was the phyllite outcrop near the Luk Ulo River. One thing that interested me there was the evidence of ancient river flow preserved near the phyllite exposure. Besides observing geological features, we also interviewed local sand miners for our final presentation project. We talked about sustainability and how

mining activities could continue while still protecting the river ecosystem. The miners were very welcoming and openly shared their experiences with us.

After the geosite visits, we attended a dinner invitation from the Kebumen government. For me, this became one of the best moments of the program. The food was delicious, the performances were entertaining, and we learned many interesting things about Kebumen. I was surprised to hear that around 10 to 15 years ago Kebumen was considered a struggling region, but now it has become one of the most visited destinations in Central Java. At the end of the night, we even received souvenirs from the local government as a token of appreciation.

On the fourth day, we explored another side of Kebumen, focusing more on social and economic activities. We visited the Sokka roof tile industry and learned how local industries support the community's economy. Then we visited a batik center and watched the batik-making process directly. I found it very interesting because it showed how culture and community empowerment are connected. The day ended with river tubing along the Luk Ulo River, which was honestly one of the most fun activities during the program. We even stopped by the river to drink fresh coconut water together.

On the fifth day, we visited SMAN 1 Karangsambung to present geoparks from our own regions. I presented about Klapanunggal Geopark and also shared a little bit about my journey entering Universitas Indonesia. It felt exciting to share experiences with high school students and introduce them to geoparks. Later that day, I joined river tubing again with the ITB group, and of course, I drank coconut water again.

afterward. At night, we discussed our group project for the final presentation.

Honestly, the week went by so fast. There were so many moments that felt special and unforgettable. I gained not only geological knowledge, but also new friendships, cultural experiences, and international connections. This summer school made me realize that geoparks are not only about rocks and landscapes, but also about people, culture, education, and sustainability. Until now, this has honestly been the best event I have ever joined.

Dream, Connecting, and Exploring: My Summer School Experience at Kebumen UNESCO Global Geopark

Alfied Ilham Maulana

Department of Management, Universitas Putra Bangsa

Participating in the Summer School at Kebumen UNESCO Global Geopark was a meaningful and transformative experience for me, both academically and personally. As a university student whose academic background focuses on Human Resource Management, I joined this program with a strong curiosity about how a geopark can be developed not only through natural resources and tourism, but also through the effective management of human resources and community collaboration. I wanted to gain a deeper understanding of how local people, institutions, and stakeholders work together to sustain and promote a geopark on an international level.

Before joining the program, I expected to meet participants from different countries and cultures, and fortunately, that expectation became a reality. Throughout the Summer School, I had the opportunity to build friendships and exchange perspectives with participants from Japan, Austria, Pakistan, Malaysia, Algeria, and Indonesia. Interacting with international participants such as Suzuka, Honoka, Riko, Takesi, Musria, Moro, Tara, Arif, Hasan, Amjad, Nurul, Ameera, Maha, Ivana, Kren, Aidil, Luqman, Afiq, Alyssa, Anis, Yasmin, Auni, Mounir, Sophie, Ikbal, Rozak, Belva, Lutfia, and Erfin created a valuable intercultural learning environment. These

interactions taught me that diversity can become a powerful bridge for collaboration and mutual understanding.

Among all the geosites we visited, Watukelir was the most memorable for me. The uniqueness of its geological landscape and the surrounding natural atmosphere left a deep impression on my mind. Visiting various geosites during the program became one of my favorite activities because each location offered different stories, educational values, and perspectives about the relationship between nature, culture, and society.

In addition, this Summer School provided important lessons regarding cross-sector collaboration and sustainable geopark development. I learned that the success of a geopark cannot rely solely on natural beauty, but also on cooperation between governments, communities, academics, tourism sectors, and young generations. This understanding broadened my perspective on how sustainable regional development should be managed in a collaborative and inclusive manner.

One of the most memorable aspects of this experience was the opportunity to establish friendships with people from many different countries. Through conversations, discussions, and shared activities, I realized that in today's global era, barriers between nations are becoming less significant. Opportunities for collaboration, innovation, and friendship remain open for everyone who is willing to learn and connect with others.

This experience strongly relates to my academic background and future aspirations. As someone who aims to contribute to regional development and community

empowerment, this Summer School motivated me to continue learning and pursuing higher education in order to create meaningful contributions for society, especially for Kebumen. I believe that sustainable development requires not only infrastructure and natural resources, but also capable human resources with global perspectives and strong social values.

If I were to describe this experience in three words, they would be "Dream, Connecting, and Exploring." These words reflect my journey throughout the program: dreaming about future contributions, connecting with people across cultures, and exploring new knowledge and perspectives. In the future, I hope to contribute more actively to the development of Kebumen and continue building international friendships and collaborations that can create positive impacts for both local and global communities.

3

My Experience at the Kebumen UNESCO Global Geopark Summer School 2026

Muhammad Afiq Najmi Bin Hamdan

Department of Marine Geosciences, Universiti Malaysia Trengganu

I participated in the Summer School on Geoconservation at Kebumen UNESCO Global Geopark as part of the ITB group. Before the field activities started, we joined pre-event online seminars on 3rd and 4th May 2026. During these sessions, many speakers shared knowledge about geoparks, geoconservation, sustainable development, tourism, and community involvement. From these talks, I learned that geoparks are not only about geology, but also about protecting nature, culture, and supporting local communities.



Picture Group Student Attended Summer School

On 7th May, we attended the symposium session. From Dr. Reza, I learned that geopark conservation requires cooperation between the government and local communities. He explained that success is not only about money, but also

about growth and improving the local economy and quality of life. From Dr. Alfend, I learned about the geological setting and tectonic history of Karangsambung and Karangbolong. Prof. Hiroki also shared interesting experiences about geopark development in Japan and how limestone is used to build stone walls for agriculture.

The Karangsambung fieldtrip on 8th May was one of the most memorable experiences for me. At the BRIN Rock Garden, we learned about rocks such as eclogite and fossiliferous limestone containing Nummulites fossils. During the visit to the Geomorphological Observation Point, I observed two different mountain morphologies caused by weathering and tectonic processes. At the serpentinite and claystone geosites, I learned that these rocks were formed due to tectonic plate collision and subduction. At Watukelir Geosite, we observed massive chert, red limestone, and pillow lava, while at Luk Ulo River we see conglomerate rocks and cherts, and also learned about mining activities in the area.

On 9th May, we were divided into groups for the Karangbolong fieldtrip. My group visited an active limestone mining site that has operated for many years. I learned that the limestone is Miocene in age and also acts as a rainwater catchment area that produces natural springs for nearby communities. On 10th May, we visited Menganti Beach and learned about coastal geological features such as columnar joints. Finally, on 11th May, I visited SMAN 1 Kebumen to give an individual presentation before enjoying river tubing activities with other participants.

Overall, this summer school gave me valuable knowledge about geology, tectonic processes, and geoconservation while also improving my communication, teamwork, and field observation skills.

4

Summer School Geoconservation on Kebumen Geopark

M. Aidil Imran

Department of Marine Geosciences, Universiti Malaysia Trengganu

Summer School Geoconservation on Kebumen Geopark is a program organized by Institut Teknologi Bandung with collaboration with Universitas Sebelas Maret. The program took place at Kebumen Geopark, with a total day of 6 days 5 night of tremendous experience. The program aims to give insight about the importance of conservation of geopark, especially Kebumen Geopark. This program also aims to link student from multiple country, creating connection, expanding communication and create wonderful memory with people with variety of major.

The first day on 7th May, a day full of symposium. The symposium divided into 2 session, with the first session consist of 4 speaker and the second session of 5 speaker. The symposium was held to give early insight and lecture about the geological and social value of geopark. As a geology student, our attention fully focused on the talk given by Dr Alfend and Dr Idham. The symposium has taught and exposed me with new knowledge and have ease my understanding towards the geological settings of Kebumen, and greatly made my fieldwork more efficient.

The second day is the most exciting day as it was the fieldwork day. We have visited multiple outcrops, geosites and mining sites. We have seen the landscape and relate the prosesess behind it. We also seen the effect of Geopark

towards local people. We may conclude that there are people that agree and there are also people who object the idea of Geopark Kebumen. There are uniqueness of each geosites, which some of them cannot be found back in Malaysia.

The third and fourth are more on visiting places around kebumen. The participants are splitted into 2 groups and each went to different places. The Karst landform at Sendang Pelus is an active mining site. Thought the owner of the mine said that they do not receive any complain of pollutions, but the effect of mining is still undeniably vast. The visits to handcrafting and weavering places also a great and plesuring visit as it shows us how handcrafting can support local communities not only locally, but impressively, globally. The next day is the visit to Menganti Beach. Menganti Beach offer an overview of tectonic activities such as subduction. It is a great experience.

The fifth day is also an interesting day. We are given task to present about ourself and geopark of our own choice in front of students. This not only boost our confidence in public speaking, but also teach local people about the geopark outside of their knowledge. Then, we went to river tubing. It was by far one of the most interesting activity along the program. It is fun not only because the trail, the nature, and the experience, but it also become more mesmerising with laughter together with our friends from another country. It really strengthen the bonding with others.

The program far exceeded my expectations. Participating in this summer school gave me the chance to learn, communicate, and bond with all participants regardless of their origin, race, or background. It was a once-in-a-lifetime

experience. I can say with confidence that the Summer School on Geoconservation at Kebumen Geopark was a great success.

5

A Piece of the Earth, a Piece of Me: My Time at Kebumen Geopark

Alyssa Natasha

Department of Marine Geosciences, Universiti Malaysia Trengganu

As the saying goes, the earth has a pulse, but in Kebumen, it's more of a whisper. Among the hills and wideopen skies of Central Java, I spent a week learning a language I never knew existed, the language of the earth. My journey at the Summer School on Geoconservation didn't start in a classroom, but rather from a very deep curiosity within. Walking through the places, I realized that Kebumen is a geological puzzle that started forming long before we arrived. Kebumen Geopark is more than just a place to visit. With its impressive collection of rock formations, it is a UNESCO World Heritage Site that preserves Melange, a beautiful mixture of different types of rocks brought together by the movement of the Earth's plates. From the Karangsambung Mountains to the Karang Bolong Limestone Caves, it has played an important role in the past and as a bridge between the past and our present.

My day began at the BRIN Rock Garden, which serves as a perfect preface to the trip with its extensive collection of rocks from across Kebumen. However, the real adventure started when I stepped into the field. Places of Pucangan Serpentine and studying the Cangkring Claystone, i was fascinated to learn that while claystone appears to be weak and it acts as vital lubricant for the massive tectonic

movements of the earth, or known as a silent humble hero in the story of plate tectonics.



Picture BRIN Karangsambung

The momentum carried me toward the striking formations of Watukelir, where the scenery shifted dramatically. Standing before the vibrant red limestone and chert, it was mind blowing to realize these were formed deep beneath the sea surface, alongside the unique pillow lava formations created by ancient underwater eruptions.

The true climax of the journey waited at the Luk Ulo River Geosite. Amidst the conglomerate, quartz, and pebbles shifted by the river's changing tides, I saw the intersection of geology and human life by noticing the mining sites where locals search for gold by tracing the presence of coal. I spent my final hours lost in the Melange, a beautiful mosaic of the Earth's crust. In a nutshell, I was no longer just looking at a landscape, but instead I was finally learning how to read it.

6

Discovering The Natural Origins of Dental Materials

Belva Nasywan Widyantara

Department of Dentistry, Universitas Jenderal Soedirman

As a dental student, my daily routine is often filled with thick books, grueling clinical training, busy labs, meeting patients in pain, and meeting friends who almost all share the same profession. But this time, it was very different. I, who was always confined to a cool, comfortable clinic, had to go out into the field, wearing a hat and boots, to explore rocks! The Kebumen UNESCO Global Geopark witnessed me become a geologist for a week. Together with fellow students from various parts of the world, including Japan, Malaysia, Austria, Pakistan, and several top Indonesian universities, we explored various World Heritage geological sites in Kebumen. This event, organized by ITB in collaboration with UNS and the Kebumen Government, was titled Summer School on Kebumen UGGp 2026 and ran from May 3-12, 2026. Even though I don't have a background in this field, I was still able to follow the explanations throughout the event because I was accompanied by highly competent lecturers in their fields who were able to explain things very well, especially to those of us who were still new to the subject.

One of the most interesting things for me was when the lecturers explained and demonstrated the natural forms of various rocks and minerals we often use in patient care, such as silica, limestone, and zircon. Imagine, I, who always

use these minerals in ready-to-use products, could now see their natural forms firsthand! This experience completely changed how I look at my dental tools. Usually, I only see materials like silica or zircon as finished products in a sterile clinic, but here I could touch their raw, natural forms directly from the ground. It was amazing to realize that the substances I use to treat patients have been part of the earth for millions of years. Seeing their "wild" side made me appreciate my profession even more, knowing that my work is so closely connected to the history of the earth.

We visited many interesting geological sites around Kebumen. Not only were they impressive, but they also served as proof that Kebumen is a region with invaluable geological riches. In line with this, the Kebumen Government is also paying serious attention to this extraordinary potential. They've built tourist areas, trained residents, enhanced the capacity of community leaders, built roads, and much more. For me, these efforts demonstrate the government's deep respect and trust in science and academia. With this potential, Kebumen has successfully proven its ability to become the region with the highest tourism revenues in the region.

We didn't just talk about rocks; we also met with people around the geopark, especially those who pan for gold around the Luk Ulo River. We had the opportunity to interview them about their work and its impact on the environment. Interestingly, we discussed the results of these interviews with students from various departments, such as urban planning, oceanography, geological engineering, and marine geology, to find the best formula for balancing conservation interests with the economic interests of community empowerment. I

also attempted to connect health with geology by analyzing the health impacts of illegal river sand mining. This analysis has the potential to serve as a reference for the government in making decisions that affect the lives of many people. My experience in this summer course demonstrates that a multidisciplinary approach is key to developing geological conservation.

Refleksi dan Pembelajaran dari Summer School Kebumen UGGp: Manfaat Geologi, Geopark, dan Catatan Penyempurnaan Kegiatan

Erfin Elly

Teknik Geologi, Institut Teknologi Bandung

Kegiatan Summer School on Kebumen UGGp Geoconservation yang diselenggarakan pada 3-12 Mei 2026 merupakan rangkaian acara yang sangat berharga bagi saya sebagai peserta. Kegiatan ini tidak hanya memberikan wawasan teoretis tentang geokonservasi, tetapi juga pengalaman lapangan yang mendalam di kawasan Karangsambung-Karangbolong, Kebumen. Melalui seminar, diskusi panel, kunjungan lapangan, serta interaksi dengan para ahli dari dalam dan luar negeri, saya memperoleh pemahaman utuh tentang bagaimana sebuah geopark dikelola secara berkelanjutan.

Apa yang Saya Pelajari

Selama mengikuti rangkaian acara, ada beberapa capaian pembelajaran utama yang saya peroleh:

1. Konsep Geokonservasi dan Identifikasi Geosite

Dari sesi Prof. Mega Fatimah Rosana, saya belajar bahwa geokonservasi bukan sekadar melindungi batuan atau fosil, tetapi juga mencakup identifikasi nilai ilmiah, edukasi, dan estetika dari setiap geosite. Evaluasi yang sistematis menjadi fondasi penting dalam pengelolaan geopark.

2. Tata Kelola dan Inovasi Digital
Sesi dari Prof. Gi Heon Kwon (Korea) dan Rino Ardhiian Nugroho (UNS) membuka wawasan saya tentang bagaimana *Smart Governance* dan inovasi digital (seperti peta interaktif, aplikasi edukasi, dan pemantauan wisatawan) dapat memperkuat promosi sekaligus konservasi geopark.
3. Praktik Baik dari Geopark Lain
Studi kasus dari Batur UNESCO Global Geopark (Ida Bagus Oka Agastya) dan Langkawi Geopark (Dr. Nur Hafizah Yusoff) menunjukkan pentingnya keterlibatan komunitas lokal, kearifan tradisional, serta kolaborasi multi-pihak dalam menjaga keberlanjutan geopark.
4. Peran Sosial dan Gender
Sesi Dr. Yuyun Sunesti tentang organisasi berbasis masyarakat dan perempuan di Indonesia mengajarkan bahwa geopark juga merupakan ruang pemberdayaan. Perempuan dan kelompok lokal dapat menjadi agen utama dalam konservasi dan pengembangan ekonomi kreatif.
5. Pengelolaan Lapangan dan Edukasi
Kunjungan ke geosite seperti Pucangan Serpentine, Cangkring Claystone, Watukelir, dan Sungai Luk Ulo memberikan pengalaman langsung mengenai proses geologi, seperti subduksi, ofiolit, dan sedimentasi. Sesi lapangan yang dipandu oleh Dr. Ir. Alfend Rudyawan dan Prof. Emmy Suparka sangat aplikatif dan membekas.

Manfaat Geologi dan Geopark bagi Saya sebagai Peserta

Sebagai peserta, saya merasakan langsung berbagai manfaat berikut:

1. Peningkatan Kapasitas Akademik dan Praktis. Saya tidak hanya memahami teori geokonservasi, tetapi juga mampu membedakan jenis batuan, mengenali struktur geologi, serta mengaitkannya dengan perencanaan wisata dan kebijakan publik.
2. Jejaring dan Kolaborasi. Kegiatan ini mempertemukan saya dengan mahasiswa, akademisi, dan praktisi dari berbagai institusi (ITB, UNS, UPM, Universiti Kebangsaan Malaysia, Ehime University, dan lain-lain). Ini membuka peluang riset bersama dan pertukaran pengetahuan.
3. Pemahaman tentang SDGs dan Pembangunan Lokal. Saya menyadari bahwa geopark bukan hanya kawasan geologi, tetapi juga alat untuk mencapai Tujuan Pembangunan Berkelanjutan (SDGs), terutama poin 8 (pekerjaan layak), 11 (kota berkelanjutan), dan 15 (ekosistem daratan).
4. Keterampilan Advokasi dan Kebijakan. Dari sesi Oscar Radyan Danar dan Dr. Asal Wahyuni, saya belajar menyusun *policy brief* dan memahami pentingnya tata kelola kolaboratif antara pemerintah, masyarakat, dan swasta.

Usulan Positif untuk Pengembangan Kegiatan Geopark Kebumen ke Depan

Berdasarkan pengalaman saya, berikut beberapa usulan positif yang dapat meningkatkan kualitas kegiatan serupa di masa mendatang:

1. Penguatan Sesi Praktik Langsung di Lapangan. Alokasi waktu untuk praktik pemetaan geologi sederhana atau simulasi identifikasi *geosite* perlu ditambah agar peserta lebih terampil.
2. Pemanfaatan Teknologi Virtual Fieldtrip. Untuk peserta yang tidak dapat hadir fisik, kegiatan dapat menyediakan virtual tour interaktif dengan narasi ahli. Ini juga mendukung promosi geopark secara global.
3. Mendorong Produk Riset Tindak Lanjut. Setelah program Summer School, peserta didorong untuk menulis artikel ilmiah atau laporan kebijakan yang dapat dipublikasikan, dengan dukungan pendampingan dari narasumber.
4. Peningkatan Keterlibatan Komunitas Lokal. Kunjungan ke sanggar tenun, genteng, batik, dan tembikar sudah baik, tetapi dapat diperkuat dengan sesi bersama masyarakat untuk mendengar langsung tantangan mereka, misalnya dalam dialog terbuka.
5. Pengembangan Modul Edukasi untuk Sekolah. Kerja sama dengan SMAN 1 Karangsambung dan SMAN 1 Kebumen dapat dilanjutkan dengan pembuatan modul ajar berbasis geopark untuk mata pelajaran geografi, biologi, atau ekonomi.

My Learning Experience Through the Summer School Program

Honoka Oie

Department of Elementary School Sub-Course, Ehime University,
Japan

When I decided to participate in this program, I initially felt anxious because it was outside my field of expertise. However, after joining the program, I discovered that students from a wide range of universities, countries, and academic backgrounds were participating. This diverse environment enabled us to exchange various perspectives and forms of knowledge, making the experience highly stimulating.

During the geology lectures, there were occasions when I struggled to fully understand the content because of my limited English proficiency. In such situations, students specializing in geology kindly supported me and helped deepen my understanding of the material. Through these lectures, I learned that Kebumen Geopark possesses geological features that are considered rare even on a global scale. The geopark contains a remarkable diversity of rocks whose ages span a vast geological timeframe. Furthermore, learning about the geological processes through which these rocks were formed made the experience even more fascinating. I was particularly surprised to discover that different types of rocks can mix together underground as a result of tectonic plate movements, which was entirely new knowledge for me.

In addition, this program allowed me to recognize the complexity and difficulty of geopark conservation. I learned that being designated as a UNESCO Global Geopark does not necessarily benefit the local people who originally inhabited the area. In some cases, conservation efforts require restrictions on local lifestyles and economic activities, making it difficult to completely halt practices such as mining. Through these discussions, I came to understand the true significance of cooperation with local communities in achieving sustainable geopark conservation.

Furthermore, participating in this program brought not only academic knowledge but also a significant change in my perspective. Until now, I had participated in various activities primarily because of my strong interest in Indonesia. However, by interacting closely with students from many different countries, I realized that my interests had broadened beyond Indonesia alone. Although I had previously interacted with people of different nationalities, I had never spent such a long period of time engaging with them as deeply as I did during this program. This experience led me to believe that sharing both challenges and enjoyable experiences over an extended period is essential for developing mutual understanding among people from diverse backgrounds.

At the same time, this program also highlighted my personal shortcomings. Throughout the program, I often remained passive despite wanting to ask more in-depth questions and communicate more actively with members of the local community. Due to my limited language ability, I was unable to fully achieve these goals. Although this left me with a strong sense of regret, it also greatly increased my

motivation to continue improving my language skills and pursue further learning in the future.

Exploring Geocotourism and Geoconservation in Kebumen Unesco Global Geopark

Kiren A/L Murali

Department of Marine Geosciences, Universiti Malaysia
Terengganu

The Geoconservation Summer School by Institut Teknologi Bandung and the Kebumen UNESCO Global Geopark provided an unforgettable experience in understanding the relationship between geology, conservation, local communities, and sustainable tourism. The programme, held from 6th to 12th May 2026, combined lectures, field observations, and community engagement activities that highlighted the importance of preserving geological heritage for future generations.

The programme began on 6th May with participant registration, briefing, and orientation activities at the Luk Ulo Karangsambung Geological Campus. On 7th May, symposium and lecture sessions introduced participants to the concept of geoconservation, sustainable geopark development, community involvement, and geocotourism practices in Indonesia and other countries. These sessions emphasized how geoparks can function not only as geological heritage sites, but also as platforms for education, conservation, and local economic growth.

The field excursion on 8th May provided direct exposure to the geological uniqueness of Kebumen.

Participants visited several important geosites, beginning with the Totogan Formation and *mélange* complex, where the tectonic history of the region was explained through various rock assemblages. At the BRIN Rock Garden, participants observed eclogite rocks, which represent high-pressure metamorphic processes that occurred deep within the Earth's crust. The visit continued to the Pucangan Serpentine Geosite, where serpentinite rocks demonstrated evidence of oceanic lithosphere emplacement.

Further observations at the Cangkring Claystone Geosite allowed participants to understand sedimentary rock formation and depositional environments. At Watukelir Geosite, pillow lava structures resting above chert layers revealed ancient submarine volcanic activity, reflecting the complex geological evolution of the Kebumen region. The final stop at Luk Ulo River Geosite highlighted river morphology and the interaction between geological structures and landscape development. These field visits showed how geological heritage can become an educational attraction while still being protected through proper conservation management.

On 9th May, the programme focused on the relationship between geoparks and local communities. A visit to the Sendang Pelus Mining Site demonstrated how small-scale limestone mining supports the daily livelihood of local residents. Although conducted on a limited scale, the activity reflected the importance of balancing economic needs with environmental sustainability. Participants also visited a weaving workshop, where local communities produced baskets and bags from dried banana tree stems. This activity

highlighted how cultural heritage and eco-friendly handicrafts can contribute to sustainable tourism and community-based economic development within the geopark region.

The excursion to Menganti Beach on 10th May further strengthened the understanding of geoecotourism. Participants observed spectacular columnar joint structures formed through volcanic cooling processes while also witnessing the development of tourism activities around the coastal geosite. The integration of geological attractions with tourism infrastructure demonstrated the potential of geoparks to promote environmental awareness and generate sustainable income for local communities.

Finally, on 11th May, participants visited secondary schools in Kebumen to present information about geoparks in their respective countries and discuss the importance of geoconservation. This educational outreach programme aimed to increase awareness among younger generations regarding geological heritage protection and sustainable development. Overall, the summer school successfully demonstrated that geoecotourism and geoconservation are interconnected approaches that can preserve Earth's geological heritage while empowering local communities socially, culturally, and economically.

A Week in Kebumen: Geology, Culture and Memories from Kebumen Geopark Summer School 2026

Lugman Bin Mohd Zaki

Department of Marine Geosciences, Univerisiti Malaysia Terengganu

As a Malaysia student with deep passion for international programs, I was very happy that I was selected to be the participants of the Summer School on Kebumen UNESCO Global Geopark 2026. Indonesia has been a country that is blessed with their extraordinary nature, and people. This programme held on 7 – 12 in Kebumen by one of the prestigious universities in Indonesia which is Institute Teknologi Bandung (ITB). Institute Teknologi Bandung (ITB) have kind heartedly provided many sponsorships to this program such as accommodations and beverages though out this entire program. This feels like a perfect opportunity to get my first experience in an international program. What made this program even more special, the host had invited many international crowd participants including Japan, Malaysia, Pakistan, Algeria and Malaysia.

First and foremost, on Day 1, it was a packed day with full opening ceremony, presentations and talks. It lasts from morning until late evening. We get to know the insights of geoconservations around the world by lecturers who brought their students into this Summer School Program. This geoconservations technique based on country include Japan, Indonesia and Malaysia which is an eye opening which

different country have different approach towards respective needs. Then, on Day 2, we visited brin Rock Garden for our first site. Here, we see eclogite rocks which mark the highest grade of metamorphic rocks. This eclogite rock is crucial in elevate the status of Kebumen Geopark as it provides proof of the rock had undergone intense heat and pressure which shaped the land lithology over millions of years. We also stopped at the observation point where we can see jagged mountains ridges stretch across the horizon at the site of the road. These jagged mountains represent melange structure which is a mixture of different types of rocks that sit together. Our final stop was Watukelir Geosite which features pillow lava structure that looks like a distinct rounded feature. The lava erupts underwater and cools rapidly which formed this unique structure.

Besides that, Day 3 was quite chill and does not have full tentative. We were brought to Menganti Beach, one of Kebumen's most stunning coastal geosites with breathtaking sceneries. Here, we observed columnar joint rock structures along the cliffside. This columnar joint structure formed through lava cooling process which has different rate of cooling between the outside and the inside. The outer side cools faster because of exposure to environment than the inside. To close the day on a warm note, Dr Reza Mardhika has generously sponsored all Kebumen Geopark 2026 to his cafe.

Last but not least, we make presentations about this during this Summer School in Kebumen Geopark 2026. This summer school was truly on of the highlighted experience in my academic journey so far. In just under a week, we get to

gained knowledge about Indonesia's Kebumen Geopark, culture, heritage, and the warmth of their people.

From Ancient Abysses to Sustainable Fibers: A Journey Through Kebumen UGGp

Lutfiana Azzahro

Department of Oceanography, Institut Teknologi Bandung

UNESCO Global Geoparks Kebumen is often referred to as the “Earth’s Amphitheater” a landscape where geological history is exposed in extraordinary detail. For an oceanography student, visiting Karangsambung felt like walking through a vertical timeline of Earth’s evolution. Through this summer school experience, I realized that Kebumen is not merely a geological destination, it is a living classroom where ancient oceanic processes interest us with sustainable community innovation.



Picture Geological BRIN Campus in Karangsambung, Kebumen

Tracing the Deep History of the Melange Complex

The journey began with an exploration of the Karangsambung Melange Complex, one of Indonesia’s most remarkable tectonic formations. Unlike ordinary rock

sequences, the melange consists of fragmented rocks of different origins and ages that were intensely deformed during tectonic activity. Standing among these formations, I encountered eclogite, a high-pressure metamorphic rock that forms at depths of approximately 30-50 kilometers beneath the Earth's surface. The presence of such rocks at the surface reflects the immense geological forces associated with the subduction of the Indo-Australian Plate beneath the Eurasian Plate.

The tectonic interaction generated complex uplift mechanisms that transported deep-ocean materials towards the surface over millions of years. The exposed slickensides—smooth and striated rock surfaces formed by friction along fault planes, serve as physical evidence of ancient crustal movements. Observing these structures provided a tangible understanding of plate tectonics that is often only discussed theoretically in classrooms.



Picture Oceanic Rocks

Watukelir: Reconstructing an Ancient Ocean

Another significant site within the geopark was Watukelir, Kelir it formed by “Clear” word and it means “bersih”, Watu is “Batu”. So, Watukelir is “Batu Bersih”, where the geological record preserves evidence of an ancient oceanic environment. The occurrence of red chert and pillow lava indicates the existence of a former mid-ocean ridge system. Pillow lava forms when molten magma erupts underwater and cools rapidly upon contact with seawater, creating rounded, pillow-shaped structures. Meanwhile, the reddish coloration of the chert reflects iron-rich silica deposition associated with ancient marine conditions.

Beyond its geological significance, Watukelir also preserves traces of prehistoric marine life. Limestone deposits containing abundant foraminifera fossils reveal that these rocks were once part of a thriving underwater ecosystem. These microscopic organisms are important biostratigraphic indicators because they help scientists determine the relative age and depositional environment of sedimentary rocks. Witnessing these fossils reinforced the realization that the mountains visible today were once submerged beneath an ancient ocean.

Menganti Beach and Columnar Rocks: Coastal Expressions of Geological Processes

One of the most captivating coastal landscapes within Kebumen UNESCO Global Geopark is Menganti Beach. Known for its dramatic cliffs and panoramic views of the Indian Ocean, Menganti Beach reflects the strong interaction between marine dynamics and geological structures. Continuous wave action, coastal erosion, and tectonic uplift

have shaped the rugged limestone hills and steep coastal morphology that characterize the area today. The beach not only offers scenic beauty, but also serves as evidence of long-term geomorphological evolution along the southern coast of Java.

Another remarkable feature found in the geopark area is the presence of columnar rock structures, often referred to as columnar joints. These formations develop when volcanic lava cools and contracts, creating polygonal fracture patterns that commonly appear as vertical stone columns. The columnar rocks in Kebumen demonstrate ancient volcanic activity that once influenced the region's geological development. Their geometric appearance illustrates how physical cooling processes can produce highly organized natural structures, making them valuable both scientifically and aesthetically.



Picture Morphology Rocks in Menganti Beach

Luk Ulo River: Small-Scale Gold Mining and Community Livelihood

Beyond its geological significance, the Luk Ulo River also serves as a source of livelihood for local communities through small-scale traditional mining activities. During the field program, my group and I had the opportunity to interview a local miner, Mr. Triyanto, who shared his experiences working as a traditional gold miner along the river. His story revealed the socio-economic dimension of the geopark landscape, where geological resources directly influence the daily lives of surrounding communities.

According to Mr. Triyanto, gold mining in the Luk Ulo River focuses on extracting fine gold particles from river sand deposits. However, the results are highly uncertain, as miners do not always find gold during their work. Despite this unpredictability, mining remains his primary occupation. The activity is conducted collectively in teams, and mining locations frequently change depending on river conditions and sediment accumulation patterns. On particularly successful days, miners may obtain up to two grams of gold, although such yields are not guaranteed.

The mining process still relies on traditional equipment, including a dulang (gold pan) and linggis (crowbar), reflecting the small-scale and manual nature of the activity. Work generally begins around 10 a.m. and continues until late afternoon. Seasonal conditions also strongly affect productivity, as mining activities usually stop during the rainy season due to increased river discharge and unsafe working conditions.

This experience highlighted that the Luk Ulo River is not only a geological archive, but also a living socio-economic landscape. The interaction between local communities and geological resources demonstrates how Earth systems continue to shape both scientific understanding and human survival in the geopark region.



Picture Sand Mining Activity in Luk Ulo River, Karangsambung

Agrominifiber and the Practice of a Circular Economy

The value of the geopark extends beyond geodiversity, it is equality reflected in the resilience and creativity of its local communities. One of the most inspiring examples was Agrominifiber, a social enterprise that transforms agricultural waste into high-value export products. By utilizing banana fibers and water hyacinth, the initiative demonstrates how local resources can support a circular and sustainable economy.

The production process combines environmental awareness with technical efficiency. A single banana stalk weighing approximately eight kilograms can produce around thirty strands of rope, while the facility itself maintains a

production capacity of nearly 10 tons per month. The products, ranging from natural ropes to vegan leather materials, are exported internationally to countries such as the United States, Australia, Thailand, and the Philippines. Remarkably, the manufacturing process relies on natural solar drying methods and environmentally friendly adhesives, minimizing carbon emissions and industrial waste.

More importantly, Agrominifiber illustrates that sustainability is not solely about environmental conservation, but also about empowering local livelihoods. The initiative successfully integrates economic development with ecological responsibility, transforming what was once considered waste into globally competitive products.



Picture Woman Community Empower to Support Agrominifiber

Traditional Roof Tiles: Geological Heritage in Everyday Life

Another interesting aspect of Kebumen's geo-cultural heritage can be seen in its traditional roof-tile craftsmanship. Beyond spectacular rock formations and tectonic structures,

geological resources in Kebumen also contribute directly to everyday community life. The production of traditional roof tiles relies heavily on clay-rich sediments derived from long-term weathering and sedimentation processes. These geological materials are carefully processed by local artisans into durable construction products that have become part of the region's architectural identity.

What makes this practice significant is not only the utilization of natural resources, but also the preservation of traditional knowledge passed down through generations. The roof-tile industry demonstrates how geological materials can support sustainable local economies while maintaining cultural continuity. In the context of the geopark, these traditional products represent a form of geo-cultural heritage, where Earth materials are transformed into functional objects that connect geology, culture, and community livelihoods.



Picture Part of Process Making Roof Tiles

Beyond Geological Conservation

Like tectonic processes that overcome immense pressure over time, the establishment of Agrominifiber also faced social and cultural challenges. Encouraging local artisans to transition from traditional production methods toward export-oriented systems required patience, collaboration, and community engagement. However, through partnerships with institutions such as the Pertamina Foundation and governmental agencies, the initiative gradually evolved into an integral part of the geopark's sustainable development program.

This experience demonstrated that geoparks are not solely about preserving rocks and landscapes. Instead, they represent an integrated approach that connects geoconservation, education, culture, and community welfare. In Kebumen, geological heritage has become a catalyst for social transformation and economic opportunity.

Final Reflection

My experience at Kebumen UGGp reshaped my understanding of the relationship between the ocean, geology, and society. From the tectonic forces that uplifted ancient oceanic rocks to the local artisans producing sustainable fibers for international markets, Kebumen embodies continuous transformation across both natural and human systems. As an oceanography student, I came to realize that the ocean does not merely shape the seafloor; it leaves enduring traces within the rocks and continues to influence the lives of communities today.

Through this journey, I learned that geological heritage is not simply a record of the past. It is also a foundation for sustainable futures, where science, culture, and local innovation can coexist in harmony

The Allure of Diversity at the Kebumen UNESCO Global Geopark as a Sustainable Tourism Destination

M. Ikbal

Department of Geological Engineering, Universitas Hasanuddin

Participating in the summer school at the Kebumen UNESCO Global Geopark was a truly memorable experience for me. This event was not only the first summer school I had ever attended, but it also broadened my perspective on how nature, culture, and communities can work together to build sustainable tourism. Alongside participants from various regions and countries, I learned that a geopark is not merely a tourist destination, but a learning space that connects people with Earth's history and the lives of local communities.

During the program, we visited several fascinating geosites within the Kebumen Geopark. One of the most memorable locations was Totogan Valley, which showcases landscapes shaped by processes of subduction, accretion, uplift, and erosion. From this site, I realized that the beautiful landscape actually holds a long story about the Earth's journey millions of years ago. Additionally, we visited the Pucangan serpentinite block and the Watukelir site, which feature unique rock outcrops such as rijang, red limestone, and basaltic lava. As a geology student, the experience of seeing these rocks firsthand was incredibly valuable, as I had previously only studied them through textbooks and lectures.

Activities on the Lukulo River also offered a different experience. We observed how local communities practice traditional gold panning along the river. This activity highlights the close connection between the community and the surrounding natural environment. Besides learning about natural resource potential, we also had the opportunity to go river tubing, which made the learning experience more enjoyable and interactive.

Beyond its geological wealth, Kebumen also possesses extraordinary cultural potential. We visited workshops for crafts made from banana tree fibers, batik production, and the Sokka roof tile industry. What particularly caught my attention was that the majority of the artisans were women who play a significant role in preserving traditions while simultaneously boosting their families' economies. From this, I learned that geopark development should not only focus on nature conservation but also on the empowerment of local communities.

In my opinion, the Kebumen UNESCO Global Geopark has great potential to become a national—and even international—tourism destination if developed with more creative innovations. The government could develop technology-based educational tourism, geopark cultural festivals, and integrated tourism packages that combine geosites, culture, and local community activities. Promotion through social media and international events could also attract more tourists, particularly the younger generation.

Through this summer school, I have come to understand that protecting nature is not just about conservation, but also about how humans can live in harmony

with the environment and culture in a sustainable manner. The Kebumen UNESCO Global Geopark serves as proof that Indonesia's natural wealth can be a source of learning, empowerment, and a better future for tourism.

Exploring Geological Heritage and Geosites at Kebumen UNESCO Global Geopark

Mahaashini Ramachanthiran
Bachelor of Marine Geoscience
Universiti Malaysia Terengganu (UMT)

Field-Based Geological Learning Experience at Kebumen UNESCO Global Geopark

Participants of the Summer School on Geoconservation of Kebumen Geopark acquired valuable knowledge and field experience related to geology, geoconservation, sustainable development, and community involvement. The program comprised symposiums, lectures, and several field trips to important geosites in the Kebumen UNESCO Global Geopark (UGGp), Indonesia. Participants explored and learned about the many rocks, mountains, and

Earth processes that formed the area over millions of years. In addition to the field activities, a number of symposium sessions focused on sustainable geopark development, geoconservation, community empowerment, and digital innovation for geopark management. These sessions provided a quick introduction to the importance of protecting geological heritage while promoting education, tourism, and local economic development.

Geological Learning through Geosite Field Trips

During the field trip sessions, summer school participants got to know the geological heritage of the Kebumen UNESCO Global Geopark. The geosites visited

during the program demonstrated the complex tectonic history, rock diversity, and geomorphological evolution of the Karangsambung and Karangbolong areas. The participants learned how Earth changes through processes like plate movement, rock transformation, sediment deposit, land rising, and erosion by observing sites in the field and listening to experts.

One of the first places I visited was the BRIN Rock Garden Geosite, where I saw a variety of rocks that represented the geological evolution of the Luk Ulo Melange Complex. The rocks exposed at the site were metamorphic, sedimentary, and igneous rocks formed in different geological environments. This geosite has introduced me to the tectonic history of Kebumen, especially about the subduction process that happened in the Cretaceous to Paleocene eras.

Later, the field trip went to the Geomorphological Observation Point in the Totogan Valley. From this position I could see the relationship between landforms, lithology, geological structures, and active surface processes. The area was demonstrating obvious effects of tectonic uplift and erosion, which created the present day landscape. Another important visited geosite during the program was the Pucangan Serpentinite Geosite. Serpentinite is an ultramafic metamorphic rock that contains iron and magnesium-rich minerals such as olivine and pyroxene. The rock is green due to its mineral composition, but weathered surfaces may be brownish in appearance due to oxidation. The serpentinite in Kebumen is closely related to oceanic lithosphere material and subduction processes. This geosite offers a better

understanding of the interaction of the tectonic plates between oceanic and continental plates.

Cangkriing Claystone Geosite, where I learned about sedimentary rock formations and depositional environments. The claystone layers represented sediment accumulation processes that occurred over long geological periods. At the Luk Ulo River Geosite, I observed the famous melange complex of Karangsambung, which consists of mixed rock fragments formed due to intense tectonic deformation in subduction zones. This location is recognized as an important outcrop or location for understanding tectonics and mountain-building processes.

The on-site study was also conducted at the Muncar River Geosite, where exposed outcrops of pillow lava and radiolarian chert were seen. The pillow lava told of underwater volcanic activity millions of years ago on the deep ocean floor. I learned that these rocks were later tectonically exhumed from deep marine environments to the surface of the Earth.

Another important site was the Luk Ulo River Geosite, which is one of the most essential geosites of the Karangsambung area. Along the river, I encountered several fragments of rock of the Luk Ulo Melange Complex. These included basalt, chert, schist, and sedimentary rocks such as conglomerate. These rocks are fragments of oceanic crust and subduction-related material that were tectonically uplifted. The river exposure provided a great natural laboratory to understand melange complexes and tectonic deformation.

Besides geological observation, I also visited the Sendang Pelus Mining Site, where the relation between geological resources and activities of the local community

could be observed. The site showcased the use of geological materials by local communities and the importance of sustainable resource management in geopark areas.

Menganti Beach was one of the most memorable geosites among all the places that were visited throughout the program. The coastal landscape was characterized by impressive cliffs, coastal rock exposures, and marine geomorphological features formed by long-term tectonic activity and coastal erosion. Besides geological importance, Menganti Beach also highlighted the importance of geotourism for sustainable development and increasing the public appreciation of geological heritage.

The field trips helped me to learn geology in a direct way, and understanding of tectonic processes and geoconservation improved in general. Seeing geological structures in nature allowed me to relate theory to real examples.

Geoconservation and Sustainable Development

I was introduced to the importance of geoconservation and sustainable geopark management during the symposium and lecture sessions. Several speakers pointed to the potential of geoparks to combine geological heritage, biodiversity, local culture, and tourism into sustainable regional development. The discussions also stressed the need for community participation, education, and environmental awareness for the preservation of geological heritage for the future generations. The program showed that geoparks are not only scientific sites but also areas of value that contribute to local economic growth and cultural identity.

Conclusion

The Summer School of Kebumen UNESCO Global Geopark gave a meaningful and educational experience. The field trips to the different geosites gave a better insight into tectonic processes, metamorphic rocks, sedimentary environments, and coastal geomorphology. The program also increased awareness of the importance of geoconservation and sustainable development of geoparks. Lectures, discussions, and field observations helped participants to realize the contribution of geological heritage to science, education, tourism, and the development of local communities.

Beyond the Rocks: Reflections on Geology, Economy, and Sustainable Development in Kebumen Geopark

Musria Nurfauzia

Department of Bioresource Production Science, Ehime University,
Japan

I went to Kebumen Geopark Summer School expecting to learn about rocks and landscapes. What I actually got was a much clearer understanding of how community development, particularly in economic terms that is deeply tied to the natural resources surrounding.

1. The Land and the Economy Are More Connected Than I Thought

As someone with a social and economic background, I tend to look at communities through the lens of livelihoods, labor and local industry. What this program added was the environmental layer I had been missing. The geological character of an area does not just determine what resources are available. It also shapes flood patterns, slope stability and agricultural potential. All of which directly affect how communities can and cannot develop economically. What I found most relevant to my field is that economic decisions made without understanding these conditions often create new vulnerabilities. Extraction without proper land management, for example, does not just damage the environment but it quietly increases disaster risk for the

same communities that depend on that land for income. The connection between economic activity and environmental risk is something I want to explore further, particularly in how it plays out in resource-dependent communities across Indonesia.

2. Conservation Is a Negotiation, Not a Policy

Before this program, I thought of conservation mainly as a policy matter which are regulations, protected zones, enforcement. What I observed in Kebumen is that conservation only works when it accounts for economic reality. Communities cannot be asked to stop using a resource without a credible alternative. And development plans that ignore local knowledge or community interests tend to fail regardless of how well-designed they look on paper. From a social and economic perspective, this is a governance challenge as much as an environmental one. The most interesting research questions for me now sit at that intersection, how do we build conservation frameworks that are economically viable for local communities, not just ecologically sound on paper? Who gets to participate in those decisions and who typically gets left out?

3. Reflection on My Next Research Steps

Since I am currently studying in Japan and far from home, coming back for this program meant more than just attending a summer school. There is a practical value to studying a place I know personally. For me, this summer school reinforced something I had been thinking about for a while, that is sustainability research in Indonesia needs more voices from within these

communities, not just observers passing through. That is the kind of contribution I want to make: research grounded in local context and actually useful to the people it is about. This experience gave me a clearer research direction. I am increasingly interested in how local communities in geopark or conservation areas negotiate their economic survival alongside environmental obligations and what role social and economic research can play in making those negotiations more informed and more fair.

Unearthing Kebumen

Summer School Kebumen 2026!

Nur Ivana Balqis

Department of Marine Geosciences, Universiti Malaysia Trengganu

When I was first selected as one of the participants in the summer school, I was on cloud nine. I was excited for the seamless, intense scientific wonder, thrilling adventure, rich culture and lifelong global connections. My arrival in Kebumen felt like I was standing in the heart of the area's culture. The spectacular subduction zone formations which linked the history of a thousand years ago. I was used to multiple fieldwork and site visits in Malaysia, but the site visits in Kebumen hit different when I could see the evidence conserved where the rocks lay. It's not about the rocks, fossils, or minerals we found. It's about the story we created. I learnt a lot through the summer school, sharing my thoughts with brilliant minds, connecting with great people who turned ordinary lessons into memorable ones. I thought geoconservation was about protecting rocks, but it is more than that. It is about keeping the community alive and celebrating its heritage. I went to Kebumen with the hope that I would bring something to share to my friends, instead, I brought back the warmth and the love from Summer School. Thank you, Kebumen!

Walking Through Earth's History: My Journey in Kebumen UNESCO Global Geopark

Nurul Hanani

Department of Marine Geosciences, Universiti Malaysia Trengganu

Nestled along the southern coast of Central Java, Kebumen UNESCO Global Geopark is an amazing destination that blends geological heritage, natural beauty, and local culture. As a UNESCO Global Geopark, the area features unique rock formations, karst landscapes, caves, waterfalls, and beautiful beaches that reveal millions of years of Earth's history. During my visit to Kebumen UGGp, I explored fascinating geosites, including ancient limestone hills and coastal cliffs. The geopark also provides chances to learn about tectonic activity and volcanic processes that shaped the area. Beyond its geological significance, visitors can experience the warm hospitality of local communities and enjoy traditional Javanese cuisine and culture. One of the highlights of visiting Kebumen UGGp is the balance between conservation, education, and tourism. The geopark promotes sustainable tourism while protecting its natural and cultural heritage for future generations. For students and researchers, especially those focused on geology and environmental studies, Kebumen UGGp offers valuable field learning experiences. Overall, a visit to Kebumen UNESCO Global Geopark is both educational and inspiring. It fosters a deeper appreciation of nature, Earth science, and the need to protect geological heritage.

Kebumen Geopark Through a Sustainability Lens

Riko Morita

Department of Environmental Design, Ehime University, Japan

During this program, I visited several geopark sites in Kebumen, such as ROCK GARDEN, Pucangan Serpentine Geosite, Luk Ulo River Geosite, and so on. Through these visits, I learned about the geological features and tourism potential of Kebumen.

However, I felt that it may be difficult for first-time visitors to explore these sites because there were not enough signs or directions. Some places had explanation boards, but others did not, so visitors may need guides to understand the importance of the sites.

In addition, most explanations were written only in Indonesian. Therefore, I think it would be helpful to prepare explanations in English and other languages for international visitors. This could help both tourism development and local community involvement.

I also visited the roof tile company, Sokka Company. During the visit, I became interested in the firing process used to make roof tiles. The company uses wood as fuel, and I wondered where the wood comes from and how it is collected.

Using wood continuously as fuel may lead to deforestation. However, the environmental impact depends on how the wood is used. For example, the impact may be smaller if people use naturally fallen wood, plant new trees, or

cut only the minimum number of trees necessary. Therefore, I think the important point is not simply whether wood is used, but whether it is used sustainably.

Through this fieldwork, I realized the importance of balancing local industry, tourism, and environmental sustainability.

My Takeaway: Why Kebumen Geopark Matters More Than I Expected

Sophie Aphrodita

Department of Geological Engineering, Universitas Gadjah Mada,
Indonesia

I'll be honest — before joining the Summer School Kebumen Geopark 2026, I thought I had a pretty good idea of what a geopark was. Conserved area with interesting rocks, some nice scenery, maybe a few informational signs along the trail. But spending time inside Kebumen UNESCO Global Geopark completely reshaped how I think about conservation, geology, and the relationship between people and the Earth beneath their feet.

Kebumen Geopark received its official UNESCO Global Geopark recognition in 2025, and after experiencing it firsthand, I can absolutely understand why. The geopark encompasses 42 geosites, and what struck me immediately was just how diverse they are. In a single day, we could go from examining ancient oceanic rocks—remnants of an ocean floor that existed millions of years ago—to walking through striking karst landscapes and standing on coastal formations shaped by relentless geological forces. As a geology student, it felt like flipping through a textbook, except the textbook was alive and stretched out beneath my feet.

What really got to me was the tectonic complexity of the area. The structures we observed tell a story of massive geological events — collisions, subductions, and deformations that took place over an incomprehensible span

of time. These are not features you can find just anywhere. They are rare, scientifically valuable, and deeply fragile. That realization made conservation feel personal to me for the first time.

But the summer school also pushed us beyond pure geology. What moved me most, though, was meeting the local communities. Their traditions, their stories, their daily lives are all woven into the landscape of the geopark in ways I had never anticipated. The geological heritage here is not just academic — it is cultural and deeply human.

Leaving Kebumen, I carry a much stronger conviction that this geopark must be conserved — not as a museum piece, but as a living, breathing system. As future geologists, we have a real responsibility to advocate for places like this. Kebumen taught me that geology is never just about rocks. It is about everything that grows, lives, and breathes above them too.

Summer School 2026 Article

Suzuka Harada

Department of Science and Technology for Biological Resources
and Environment, Ehime University

Why I joined this program

My decision to participate in this summer school stems from my keen interest in primary industries and local communities situated in areas with abundant natural tourism resources. Having grown up in a region home to one of Japan's prominent Geoparks, Geopark field trips have been an integral part of my education since elementary school. However, as I have never had the opportunity to visit a Geopark abroad, I decided to join this program in pursuit of practical, experiential learning that extends beyond the foundational geology I studied in Japan.

My Expectations

I hope to leverage the unique geological characteristics and academic insights of Indonesia, particularly Kebumen, to actively enhance educational programs in my hometown. In Japan, many regions with Geoparks are facing challenges such as depopulation and an aging society, and I have often observed the difficulties these areas encounter in both community management and park operations. Therefore, as an active member of the local community and a representative of the younger generation, my goal is to bring back a broad and deep understanding of geology to contribute to these efforts.

What I learned and discovered

In my final presentation, I focused on the Karangsambung Geopark in Kebumen, and my subsequent activities were guided by an action plan based on this presentation, allowing me to deepen my understanding of geology. Among the various sites, the complex topography of Totogan Valley left a particularly strong impression on me. I was able to gain profound geological insights and capture the distinct local way of life by observing the mountainous terrain formed by subduction zone wrinkling, the resulting water systems, and the local communities whose livelihoods depend on these water flows. Furthermore, regarding the local lifestyle, I visited workshops where daily necessities are crafted using banana peels and pandan leaves, respectively. I was deeply impressed by the depth of the community's initiatives, such as rehabilitation programs tailored for prison inmates.

Conversely, throughout the entire program, opportunities to exchange opinions with residents living around the campus and the geosites were extremely limited. As a result, I could not engage in substantive discussions to gather local perspectives regarding infrastructure development, one of the key challenges facing the Kebumen Geopark. Consequently, I believe that establishing a foundational framework for cooperation with the surrounding communities is a critical task for the future of this summer school.

Final Reflections

In closing, participating in this program allowed me to engage with an international and multidisciplinary group of students, which provided me with a wealth of new inspiration. While there were many moments where I felt the need for further personal growth in terms of knowledge and communication, I was also able to discover new challenges to pursue.

In particular, this entire summer school served as a powerful reminder of the importance of viewing things objectively. At the same time, I discovered the vast scale of our planet and the many wonders that remain unknown.

Therefore, to ensure the sustainable development of all the wonderful villages in Kebumen, I hope that next summer school will provide opportunities for deeper discussions among students, as well as with local residents. Furthermore, I wish the summer school program continued success and vibrant development in the future.

Experiences Visiting Kebumen UGGp and Learning Experiences throughout The Summer School

Takeshi Kusakabe

Department of Urban and Regional Planning, Kanazawa University,
Japan

“Rather than just studying theories in a classroom, I want to see how you engage residents in daily geoconservation and cultural activities like pottery.” This was the motivation why I wanted to join before summer school. Before summer school, I thought geoscience was difficult. It’s too far from my major, which is urban planning. But I thought Geopark could be connected with my topic.

In the pre-event, I learned many things about Geopark from the lecturer. Regardless of my background in urban planning, there are many interesting topics. Thanks to these lectures, my field survey has become a really fulfilling experience. In my case, a field survey is the first time in my life. Therefore, before that, I did not have any idea what we did and how excited. After joining the field survey, I feel the field survey is a more practical class because we can learn not only from the lecturer but also from real ones. Especially, in my case study team, we are in charge of the balance between economic needs and river ecosystem sustainability. In the river, there were people who were doing sand and gold mining. Probably, we learn about sand and gold mining from the classroom materials or textbooks. However, we could do

an interview to know the details of the activity. It was good learning for me. Also, it gave me a lot to think about, especially I felt there were many problems.

Before summer school, I did not know about Kebumen. However, after I visited Kebumen, I realised there are many attractive places to visit since there are many beautiful nature, rivers, beaches, cultural places, geological sites, and more. In the lecture, I learned that to be a Geopark, we need three aspects: Geodiversity, Cultural diversity, and Biodiversity. In Kebumen, we already have these elements. For tourism, I feel there is a big potential in Kebumen. In the aspects of Geodiversity and Biodiversity, from the field survey, we have many locations to visit in Kebumen, especially for cultural diversity. For international tourists, banana hand-made craft, batik, and the process of making roof tile is so attractive to foreign people. In Kebumen, there are also many good local foods, friendly people, and unique traditions that can attract both domestic and international tourists.

However, from the perspective of my major, urban planning, I feel there is one problem in Kebumen from the field survey. For the tour, it is difficult to visit many places since not all places are close, for example, from Karangsembung to Menganti Beach it took 2 hours. According to the bus driver, there is transportation, but not in all areas. In my opinion, to become a worldwide place, we need to arrange transportation or a tour package with a car service.

Kebumen Tourism Loop: Merangkai Potensi Indikasi Geografis melalui Jalur Wisata Terpadu

¹Regina Cahya Dianingsih, ²Muhammad Farid Nugroho,

³Nur Anis Amalina

¹²Universitas Sebelas Maret, ³Universiti Kebangsaan Malaysia

Pendahuluan

Kabupaten Kebumen mempunyai banyak hal yang bisa dibanggakan. Bukan hanya soal pantai atau wisata alam, tetapi juga kekayaan produk lokal yang lahir dari kondisi geografis dan keterampilan masyarakatnya. Sebagai percontohan di sektor kerajinan, terdapat Genteng Sokka Kebumen yang telah mengajukan permohonan pendaftaran Indikasi Geografis (IG) sejak 2019 dan dipublikasikan DJKI melalui Berita Resmi Indikasi Geografis Nomor 011/E-IG/VIII/A/2020 (Direktorat Jenderal Kekayaan Intelektual, 2020). Meski demikian, hingga awal 2025 Kemenkumham Wilayah Jawa Tengah bersama Bapperida Kebumen masih terus mendampingi proses ini agar pendaftarannya tuntas. Sebagai komparasi yang sejajar, Kebumen juga memiliki potensi kuat di sektor hasil bumi dan kuliner, seperti Gula Semut, Sate Ambal, dan Nasi Penggel. Produk-produk ini bukan sekadar pelengkap, melainkan aset dengan reputasi dan karakter khas yang sama-sama memiliki urgensi tinggi untuk dikaji sebagai potensi Indikasi Geografis. Modal kekayaan intelektual ini berdiri sejajar melengkapi pesona Kebumen UNESCO Global Geopark yang resmi ditetapkan pada Sidang Dewan Eksekutif UNESCO ke-221 di Paris pada

April 2025 (Pemerintah Kabupaten Kebumen, 2025). Masalahnya, berbagai potensi tersebut belum banyak dirasakan sebagai satu kesatuan pengalaman wisata. Sepanjang Januari–September 2025 tercatat 3,04 juta perjalanan wisatawan nusantara ke Kebumen, sementara rata-rata lama menginap hanya 1,11 malam (Badan Pusat Statistik Kabupaten Kebumen, 2025). Angka ini menunjukkan bahwa wisatawan memang datang, tetapi sebagian besar belum memiliki banyak waktu untuk menjelajahi lebih jauh potensi lokal yang ada.



Gambar Skema Kebumen Tourism Loop
Sumber: Penulis, 2026

Isi

Kebumen bukan kekurangan potensi, tetapi banyak di antaranya masih berjalan sendiri-sendiri. Pemerintah Kabupaten Kebumen sejatinya telah memasukkan penguatan integrasi dan peningkatan konektivitas antardestinas sebagai

arah pembangunan pariwisatanya (Pemerintah Kabupaten Kebumen, 2024). Untuk menerjemahkan arah tersebut menjadi pengalaman yang mudah dinikmati, Kebumen Tourism Loop hadir sebagai sebuah sistem “trayek” atau jalur wisata terpadu yang terjadwal. Mengadaptasi sistem *city tour* yang terstruktur, rute perjalanan dikemas dalam satu *bundling* transportasi, tiket, aktivitas edukasi, hingga kuliner.

Poin kuncinya adalah rute ini tidak boleh terkotak-kotak. Wisatawan tidak hanya disugahi satu jenis tema, melainkan kombinasi lintas sektor yang aksesibel dalam satu trayek. Sebagai contoh implementasi trayek harian:

- Trayek Gombong *Heritage & Sempor Leisure* (Rute Barat): Wisatawan diajak mengunjungi situs sejarah Benteng Van der Wijk, dilanjutkan dengan wisata edukasi di Museum Roemah Martha Tilaar. Perjalanan ini kemudian bergeser untuk menikmati suasana alam dan kuliner mendoan hangat di tepi Waduk Sempor.
- Trayek *Southern Geo-Coast & Sweetness* (Rute Selatan): Rute ini membawa wisatawan mengeksplorasi perut bumi di Goa Jatijajar, dilanjutkan dengan kunjungan ke sentra Gula Semut di Desa Argosari, Kecamatan Ayah untuk melihat langsung masyarakat mengolah nira bernilai ekonomi. Perjalanan ditutup dengan menikmati pemandangan laut dan sunset di Pantai Menganti.
- Trayek Karangsambung *Geo-Heritage & Authentic Craft* (Rute Tengah – Utara): Rute ini memadukan edukasi geokonservasi dan kerajinan. Wisatawan diajak menjelajahi formasi batuan purba di kawasan Kebumen UNESCO Global Geopark di

Karangsambung. Setelah itu, trayek dihubungkan dengan kunjungan ke sentra Genteng Sokka di Sruweng atau Pejagoan untuk memahami karakter tanah lokal, lalu diakhiri dengan menikmati kuliner legendaris Sate Ambal atau Nasi Penggel.

Cara seperti ini sangat sejalan dengan arah baru DJKI melalui konsep *GI Tourism* pada tahun 2026, di mana Indikasi Geografis tidak berhenti sebagai label, tetapi menjadi pengalaman wisata partisipatif (DJKI, 2026). Wisatawan datang ke wilayah asal produk, bertemu masyarakatnya, melihat prosesnya, dan memahami cerita di baliknya.

Implementasi trayek terpadu ini membutuhkan kolaborasi lintas sektor. Bapperida bertindak sebagai integrator kebijakan, Dinas Pariwisata dan Kebudayaan meramu kurasi destinasi, Disperindag KUKM menyambungkan UMKM potensial IG ke dalam rute, dan Dinas Perhubungan memastikan ketersediaan armada bus serta ketepatan jadwal trayek. Di akar rumput, Pokdarwis, *Kebumen Geopark Youth Forum* (KGYF), dan masyarakat bertindak sebagai *co-creator* yang memandu dan menghidupkan ekosistem wisata ini. Pola ini mengukuhkan praktik *collaborative governance*, di mana pemerintah dan masyarakat menyelesaikan tantangan publik secara bersama-sama (Ansell & Gash, 2008).

Penutup

Kebumen Tourism Loop bukan sekadar program penyediaan bus wisata. Bus dan penetapan trayek hanyalah alat untuk menghubungkan kepingan yang selama ini terpisah: pesona alam, sejarah, kerajinan, kuliner, dan masyarakat. Melalui rute perjalanan yang dikurasi dan

dipadukan secara lintas sektor, wisatawan mendapatkan pengalaman yang lebih praktis, padat, dan bermakna. Di saat yang sama, produk lokal mendapatkan panggung promosi, UMKM memperluas pasar, dan durasi menginap wisatawan dapat ditekan agar lebih lama. Tantangannya kini adalah konsistensi mengelola trayek-trayek tersebut agar terus terhubung. Melalui Kebumen Tourism Loop, perjalanan wisata di Kebumen akan bertransformasi dari sekadar “singgah di tempat wisata” menjadi “menyelami karakter dan membawa pulang identitas Kebumen.

Referensi

- Ansell, C., & Gash, A. (2008). Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory*, 18(4), 543–571. <https://doi.org/10.1093/jopart/mum032>
- Badan Pusat Statistik Kabupaten Kebumen. (2025, November 12). *Perkembangan pariwisata di Kabupaten Kebumen September 2025* [Berita Resmi Statistik]. <https://kebumenkab.bps.go.id/id/pressrelease/2025/11/12/382/perkembangan-pariwisata-di-kabupaten-kebumen-september-2025.html>
- Direktorat Jenderal Kekayaan Intelektual. (2020, Agustus 6). *Berita resmi Indikasi Geografis Seri-A Nomor 011/E-IG/VIII/A/2020: Permohonan pendaftaran Indikasi Geografis Genteng Sokka Kebumen*. Kementerian Hukum dan Hak Asasi Manusia Republik Indonesia. <https://dgip.go.id/berita-resmi/52/download>
- Direktorat Jenderal Kekayaan Intelektual. (2026). *Menyusuri jejak Indikasi Geografis di jalur mudik Pantura dan Pansela*. Kementerian Hukum Republik Indonesia.

<https://www.dgip.go.id/artikel/detail-artikel-berita/menyusuri-jejak-indikasi-geografis-di-jalur-mudik-pantura-dan-pansela>

Pemerintah Kabupaten Kebumen. (2015, November 20).

Nikmati sensasi sarapan dengan Nasi Penggel kuliner khas Kebumen. [URL perlu dicek ulang oleh penulis]

Pemerintah Kabupaten Kebumen. (2024). *Rencana*

pembangunan jangka panjang daerah Kabupaten Kebumen. [URL perlu dicek ulang oleh penulis]

Pemerintah Kabupaten Kebumen. (2025). *UNESCO Global Geopark* *Kebumen.*

https://www.kebumenkab.go.id/index.php/web/potenda_detail/28/54

Dari Sekadar Informasi Menuju Pengalaman: Pengembangan Website Geopark Kebumen

¹Izaaz Akbar Ashidqi, ²Alam Fajar Rohman, ³Nurul Izzati

¹²Universitas Sebelas Maret, ³Universiti Kebangsaan Malaysia

Pendahuluan

Pariwisata saat ini tidak hanya berkembang sebagai aktivitas rekreasi, tetapi juga menjadi salah satu instrumen dalam mendorong pembangunan ekonomi daerah, pelestarian lingkungan, dan pemberdayaan masyarakat. Salah satu bentuk pengembangan pariwisata yang mengintegrasikan berbagai kepentingan tersebut adalah geopark. Berbeda dengan kawasan wisata yang hanya berorientasi pada daya tarik rekreasi, geopark mengintegrasikan warisan geologi, keanekaragaman hayati, dan keragaman budaya melalui tiga fungsi utama, yaitu konservasi, edukasi, dan pembangunan ekonomi masyarakat secara berkelanjutan. Konsep tersebut sejalan dengan Peraturan Presiden Nomor 9 Tahun 2019 tentang Pengembangan Taman Bumi (Geopark), yang menempatkan geopark sebagai kawasan yang dikelola untuk menjaga warisan geologi, keanekaragaman hayati, dan keragaman budaya sekaligus meningkatkan kesejahteraan masyarakat.

Kabupaten Kebumen memiliki potensi pariwisata yang kuat melalui keberadaan Geopark Kebumen. Kawasan ini memiliki keragaman geologi, hayati, dan budaya yang tersebar di berbagai wilayah. Pemerintah Kabupaten Kebumen mencatat bahwa kawasan geopark memiliki sejumlah situs yang dikelompokkan ke dalam *geosite*, *biosite*,

dan *culturesite*. Dinas Pariwisata dan Kebudayaan Kabupaten Kebumen 2025 mencatat sebanyak 42 *geosite*, 9 *tangible culture site*, 15 *intangible culture site*, dan 8 *biosite*. Potensi tersebut mencakup kawasan Karangsambung dengan kekayaan geologinya, kawasan karst dan gua seperti Goa Jatijajar dan Goa Petruk, serta berbagai warisan budaya dan keanekaragaman hayati yang berkembang di masyarakat.

Besarnya potensi tersebut semakin memperoleh legitimasi setelah Geopark Kebumen mendapatkan pengakuan sebagai UNESCO Global Geopark pada tahun 2025. Kawasan ini mencakup 22 kecamatan dan memiliki berbagai situs geologi, biologi, serta budaya yang dapat dikembangkan sebagai bagian dari pariwisata berkelanjutan. Pengakuan internasional tersebut pada satu sisi menjadi modal penting dalam membangun citra Kebumen sebagai destinasi geowisata, tetapi pada sisi lain juga menghadirkan tantangan baru. Status dan banyaknya potensi yang dimiliki tidak secara otomatis membuat seluruh daya tarik tersebut dikenal, dipahami, dan dipertimbangkan oleh calon wisatawan. Dengan kata lain, persoalan pengembangan Geopark Kebumen tidak hanya terletak pada ketersediaan objek wisata, tetapi juga pada bagaimana informasi mengenai potensi tersebut dapat disampaikan secara efektif kepada masyarakat dan calon wisatawan.

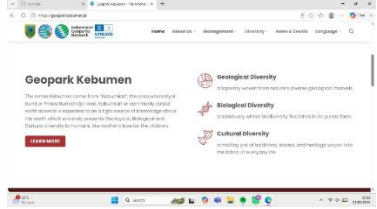
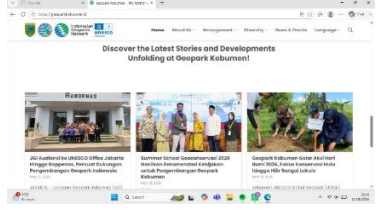
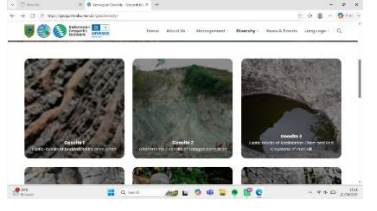
Isi

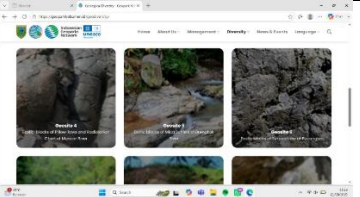
Di zaman yang sudah digital ini, website bisa menjadi salah cara guna meningkatkan kunjungan wisatawan lokal maupun internasional. Hal ini sejalan dengan konsep *e-tourism*, yaitu pemanfaatan teknologi digital untuk memfasilitasi promosi destinasi, sistem reservasi *online*,

hingga interaksi dengan wisatawan, yang menjadi krusial di era digital karena mampu memberikan akses informasi secara cepat (Hamid et al., 2021). Karena pasti sebelum memulai sebuah perjalanan, wisatawan pasti membutuhkan informasi untuk membentuk gambaran mengenai gambaran destinasi wisata yang akan dikunjungi sekaligus mempertimbangkan keputusan berkunjung.

Penelitian yang dilakukan oleh Aji dan Andadari (2021) terkait Pengaruh *Media Sosial Instagram Dan Website Terhadap Minat Kunjung Wisatawan*. Hasil Penelitian menunjukkan bahwa penggunaan media sosial Instagram dan website menunjukkan penilaian rata-rata sebesar 3,90 (baik) dan 3,78 (baik). Artinya responden dalam penelitian ini menggunakan Instagram dan website untuk menemukan berbagai informasi mengenai tempat wisata. Melalui Instagram mereka bisa melihat postingan dalam bentuk video/foto, *hashtag* atau tagar dari tempat yang ingin mereka kunjungi dan melalui website mereka mendapatkan informasi mengenai tempat yang mereka akan kunjungi serta meningkatkan rasa *exited* dan percaya bahwa informasi yang diberikan website benar.

Tabel Gambaran Pengembangan Website
Sumber : Penulis, 2026

Before	After
 Tampilan website original	 Tampilan website rekomendasi informasi dan kunjungan
 Tampilan website original	 Tampilan website paket wisata dan penginapan
 Tampilan website original	 Tampilan website informasi akses transportasi

Before	After
 Tampilan website Original	 Tampilan website jelajah dengan fitur AR
 Tampilan website Original	 Tampilan website optimalisasi informasi diversity

Saat ini Geopark kebumen memiliki website untuk memberikan informasi sejarah, budaya, keanekaragaman geologi, tempat wisata menarik sampai produk geologi yang dibuat oleh masyarakat sekitar. Permasalahan yang dihadapi adalah website Geopark Kebumen masih sebatas menyajikan informasi mengenai berbagai daya tarik yang dimiliki, namun belum menyediakan informasi yang memandu pengunjung untuk menikmati dan mengakses setiap keragaman (*diversity*) yang tersedia di kawasan tersebut. Oleh karena itu, pengembangan website perlu dilakukan agar lebih menarik perhatian dan menjawab semua kebutuhan pengguna dalam satu pintu terutama wisatawan yang ingin berkunjung. Gagasan utama yang dikembangkan yaitu dengan

mengembangkan website agar lebih menarik dan mempermudah wisatawan yg ingin hadir dengan:

1. **Informasi Wisata dan Kunjungan:** menyediakan informasi mengenai operasional jam buka dan jam tutup tempat wisata beserta harga tiket untuk memasuki wisata tersebut agar pengguna dapat lebih mudah mengatur jadwal kedatangan mereka.
2. **Reservasi Paket Wisata dan Penginapan:** menyediakan paket wisata agar wisatawan dapat lebih mengeksplorasi tempat wisata yang ada seperti *Kebumen Tourism Loop* dan informasi lokasi penginapan terdekat beserta nomor telepon reservasi tempat penginapan, sebagai tempat singgah selama *explore*.
3. **Informasi akses transportasi:** menyediakan Informasi akses transportasi umum yang dapat digunakan untuk menempuh perjalanan menuju tempat wisata, sehingga wisatawan yang mencari transportasi umum tidak kesulitan mencari akses transportasi umum menuju tempat wisata.
4. **AR (*Augmented Reality*):** Aplikasi berbasis kamera smartphone yang memungkinkan pengguna memproyeksikan objek/batuan geologi menjadi 3D yang diproyeksikan ke dunia nyata. Dengan ini informasi yang tadinya berupa teks biasa dapat diproyeksikan sebagai animasi interaktif menarik secara real-time, sehingga wisatawan dapat lebih memahami proses terbentuknya batuan geologi yang ada.

5. **Optimalisasi informasi *diversity*:** menambahkan informasi pada setiap *diversity* yang ada seperti sejarah singkat, fakta menarik, dan visual gambar 3D. Dengan inovasi ini pengguna akan lebih mengenal keberagaman yang dimiliki oleh Geopark Kebumen.

Penelitian yang dilakukan (Putra et al., 2021) pembaruan tampilan website berpengaruh 51% terhadap pemenuhan kebutuhan informasi wisatawan hasil menunjukkan bahwa adanya pembaruan website berperan dalam pemenuhan kebutuhan informasi yang dibutuhkan pengguna. Oleh karena itu, inovasi ini disusun untuk menyelesaikan masalah website kebumen yang masih sekadar menampilkan informasi secara satu arah berupa teks dan foto statis mengenai profil geopark, sejarah, serta daftar situs geologi dan budaya, tanpa dilengkapi fitur interaktif seperti peta lokasi, sistem reservasi, maupun visualisasi digital yang dapat membantu wisatawan memahami dan merencanakan kunjungan. Kondisi ini membuat website lebih berfungsi sebagai katalog informasi bukan sebagai platform layanan wisata yang mampu menjawab kebutuhan praktis pengunjung, mulai dari perencanaan perjalanan hingga pengalaman edukatif di lapangan.

Penutup

Transformasi website Geopark Kebumen dari sekadar katalog informasi statis menjadi platform wisata digital yang interaktif. Hal ini merupakan langkah strategis dalam memaksimalkan potensi geologi, hayati, dan budaya yang dimiliki kawasan ini agar lebih dikenal dan diminati wisatawan. Hal ini sejalan dengan temuan Haryono dan

Albetris (2022) yang menunjukkan bahwa pemanfaatan e-tourism marketing secara signifikan berperan dalam meningkatkan niat berkunjung wisatawan sebelum mereka benar-benar memutuskan untuk berkunjung. Dengan menghadirkan fitur informasi kunjungan yang lengkap, sistem reservasi paket wisata dan penginapan, akses transportasi yang jelas, teknologi Augmented Reality, serta optimalisasi konten *diversity*, website ini diharapkan dapat menjadi pintu masuk tunggal yang tidak hanya informatif, tetapi juga mempermudah wisatawan dalam merencanakan dan menikmati perjalanan mereka. Pada akhirnya, pengembangan website interaktif dan berorientasi pada kebutuhan wisatawan bertujuan untuk meningkatkan minat wisatawan untuk berkunjung sekaligus mendukung edukasi dan konservasi Geopark kebumen.

Referensi

- Aji, C., & Andadari, R. K. (2021). Media Sosial Instagram Dan Website Terhadap Minat Kunjung Wisatawan. *Jurnal Penelitian dan Pengembangan Sains dan Humaniora*, 5(1), 54-63.
- Chung, N., Han, H., & Joun, Y. (2015). Tourists' intention to visit a destination: The role of augmented reality (AR) application for a heritage site. *Computers in human behavior*, 50, 588-599.
- Dinas Pariwisata dan Kebudayaan Kabupaten Kebumen <https://disparbud.kebumenkab.go.id/index.php/web/post/1138/narasi-ringkasan-geopark-kebumen>
- Hamid, R. A., Albahri, A. S., Alwan, J. K., Al-Qaysi, Z. T., Albahri, O. S., Zaidan, A. A., ... & Zaidan, B. B. (2021). How smart is e-tourism? A systematic review of smart tourism

- recommendation system applying data management. *Computer Science Review*, 39, 100337.
- Haryono, G., & Albetris, A. (2022). Peranan komunikasi pemasaran pariwisata melalui pemanfaatan e-tourism marketing untuk meningkatkan niat berkunjung wisatawan. *Ekonomis: Journal of Economics and Business*, 6(1), 136–143.
- Japanese Geoparks Network. (2026). *Japanese Geoparks Network*.
- Pemerintah Kabupaten Kebumen. (2026). *Mengenal Geopark Kebumen, Harmoni Warisan Geologi, Keanekaragaman Hayati, dan Budaya*.
- Peraturan Presiden Nomor 9 Tahun 2019 tentang Pengembangan Taman Bumi (Geopark).

Turtle Journey: Inovasi Digital Adopsi Simbolis Penyu Berbasis Konservasi dan Eduwisata dalam Mendukung Pariwisata Berkelanjutan di Geopark Kebumen

¹Alya Nur Syafa, ²Elsa Nur Handayani, ³Amira Sofea

¹²Universitas Sebelas Maret, ³Universiti Putra Malaysia

Pendahuluan

Kebumen resmi ditetapkan sebagai UNESCO Global Geopark pada Sidang Dewan Eksekutif UNESCO ke-221 di Paris, April 2025, predikat yang menuntut komitmen menjaga warisan geologi, hayati, dan budaya di 22 kecamatan (Pemerintah Kabupaten Kebumen, 2025). Salah satu kekayaan hayati yang menopang predikat tersebut ada di pesisir selatannya, diantaranya Penyu hijau, penyu sisik, dan penyu lekang secara rutin mendarat dan bertelur di pesisir selatan Kebumen, termasuk Pantai Kembar Terpadu, Desa Tambakmulyo (Badan Pengelola Geopark Kebumen, 2026). Setiap tahun, lebih dari 1.000 tukik dilepasliarkan dan lebih dari 5.000 peserta mengikuti edukasi konservasi (Konservasi Pantai Kembar Terpadu, n.d.). Angka yang mengesankan, tetapi menyimpan ironi dari seribu tukik yang dilepas, diperkirakan hanya satu yang bertahan hidup hingga dewasa. Wisatawan selama ini hanya menyaksikan babak paling akhir dan paling aman momen pelepasan ke ombak, sementara pertarungan sesungguhnya, sejak telur rentan predator hingga tukik berlomba dengan waktu menuju laut, berlangsung tanpa saksi dan nyaris luput dari perhatian. Kesenjangan

antara besarnya minat publik dan minimnya keterlibatan nyata inilah yang mendorong perlunya sebuah jembatan digital.

Isi



Gambar Turtle Journey

Sumber: Penulis, 2026

Menjawab kesenjangan tersebut, penulis merekomendasikan layanan *Turtle Journey*, layanan digital bertagline "Satu kontribusi, satu kehidupan" yang dirancang menjadi bagian dari layanan "satu pintu" digital Geopark Kebumen. Wisatawan tidak lagi sekadar menyaksikan dari kejauhan. Mereka diajak menjadi bagian dari perjalanan konservasi itu sendiri, mengikuti setiap tahap mulai dari penemuan telur hingga pelepasliaran tukik ke laut lepas, kapan pun dan dimanapun mereka berada.

Fitur utama pertama, *Adopt a Nest*, memungkinkan pengguna memilih dan memberikan kontribusi konservasi untuk sarang tertentu, misalnya Nest #TG-027 di Pantai

Kembar Terpadu yang tengah menampung 87 butir telur berstatus inkubasi. Setelah mengadopsi, pengguna memperoleh akses ke *dasbor Watch Your Turtle Grow*, ruang yang menampilkan progres inkubasi, status kesehatan sarang, catatan singkat dari konservator, serta linimasa bertahap mulai dari *Eggs Found*, *Nest Relocated*, *Incubation*, *Hatching*, hingga *Release*. Transparansi semacam ini membangun ikatan emosional antara wisatawan dan tukik yang mereka adopsi, sekalipun perawatan fisik tetap sepenuhnya berada di tangan konservator lapangan.

Sisi edukasi disisipkan melalui *Turtle School*, berupa narasi singkat dan kuis interaktif yang muncul mengikuti tahap perkembangan sarang, lengkap dengan poin sebagai bentuk penghargaan. Pendekatan gamifikasi ini sejalan dengan temuan Supriyanto (2017), yang mengungkapkan bahwa integrasi mekanisme permainan pada media informasi ekowisata mampu meningkatkan partisipasi dan loyalitas wisatawan, sekaligus menghasilkan data pendukung keberlanjutan pengelolaan kawasan. Poin yang terkumpul, baik dari edukasi, adopsi, beach clean-up, maupun kunjungan langsung ke Pantai Kembar, dapat ditukar dengan merchandise, voucher UMKM lokal, atau pengalaman wisata melalui fitur *Turtle Points*. Konservasi pun turut menggerakkan roda ekonomi masyarakat pesisir. Puncak dari seluruh rangkaian ini adalah *Release Day*, momen pelepasliaran tukik ke laut yang mempertemukan wisatawan, dalam perannya sebagai "orang tua asuh" digital, dengan tukik yang perkembangannya mereka ikuti selama ini. Momen ini sekaligus memperkuat kegiatan pelestarian yang rutin digelar di Pantai Kembar Terpadu, seperti pelepasan 80

ekor tukik pada Juni 2026 (Badan Pengelola Geopark Kebumen, 2026).

Keberlanjutan *Turtle Journey* tidak mungkin berjalan sendiri. Ia memerlukan sinergi banyak pihak. Badan Pengelola Geopark Kebumen bersama Pemerintah Kabupaten Kebumen berperan mengintegrasikan platform ini ke layanan digital satu pintu geopark. Konservasi Penyu Pantai Kembar Terpadu bertindak sebagai pengelola teknis lapangan sekaligus sumber data sarang. UMKM dan BUMDes Desa Tambakmulyo berperan sebagai mitra penyedia reward Turtle Points. Mengingat status penyu yang dilindungi penuh berdasarkan Peraturan Pemerintah Nomor 7 Tahun 1999 (Peraturan.go.id, 1999), dukungan BKSDA selaku otoritas konservasi, ditambah kemitraan CSR perusahaan dan lembaga swadaya masyarakat lingkungan, menjadi penopang penting bagi legalitas dan pendanaan jangka panjang program ini.

Penutup

Turtle Journey menunjukkan bahwa teknologi digital dapat menjadi jembatan yang mendekatkan wisatawan dengan proses konservasi yang selama ini tidak terlihat, sekaligus menghadirkan pengalaman eduwisata yang lebih bermakna di Kebumen sebagai UNESCO Global Geopark. Diharapkan inovasi ini tidak hanya meningkatkan kunjungan ke Pantai Kembar Terpadu, tetapi juga menumbuhkan rasa memiliki masyarakat luas terhadap kelestarian penyu Indonesia. Mari menjadi bagian dari perjalanan ini, satu kontribusi, satu kehidupan.

Referensi

- Badan Pengelola Geopark Kebumen. (2026, 8 Juni). 80 ekor tukik dilepasliarkan di Pantai Kembar Terpadu, perkuat biodiversitas Kebumen UNESCO Global Geopark. Geopark Kebumen. <https://geoparkkebumen.id/80-ekor-tukik-dilepasliarkan-di-pantai-kembar-terpadu-perkuat-biodiversitas-kebumen-unesco-global-geopark/>
- Kompas.com. (2024, 6 Mei). Pantai Kembar Terpadu di Kebumen, tempat wisata edukasi konservasi penyu tanpa biaya masuk. <https://travel.kompas.com/read/2024/05/06/091546327/pantai-kembar-terpadu-di-kebumen-tempat-wisata-edukasi-konservasi-penyu-tanpa>
- Konservasi Pantai Kembar Terpadu. (n.d.). *Beranda*. Diakses 21 Agustus 2026, dari <https://konservasikembarterpadu.com/>
- Pemerintah Kabupaten Kebumen. (n.d.). Pantai Kembar Terpadu. Diakses 21 Agustus 2026, dari https://www.kebumenkab.go.id/index.php/web/potenda_detail/45/34
- Pemerintah Kabupaten Kebumen. (2025, 12 Juli). Bupati Kebumen lepas tukik di Pantai Kembar: Wujud nyata sinergi alam, budaya, dan pariwisata. https://www.kebumenkab.go.id/index.php/web/news_detail/2/8117
- Pemerintah Provinsi Jawa Tengah. (2024, 9 September). Geopark Kebumen resmi jadi UNESCO Global

Geopark.

<https://jatengprov.go.id/beritadaerah/158823/>

Peraturan.go.id. (1999). *Peraturan Pemerintah Republik Indonesia Nomor 7 Tahun 1999 tentang Pengawetan Jenis Tumbuhan dan Satwa*.
<https://peraturan.go.id/id/pp-no-7-tahun-1999>

Supriyanto, S. (2017). Perancangan penerapan gamifikasi pada media informasi ekowisata. *Seminar Nasional Aplikasi Teknologi Informasi (SNATI)*.
<https://journal.uui.ac.id/index.php/Snati/article/view/8487>

UNESCO. (n.d.). Kebumen UNESCO Global Geopark. International Geoscience and Geoparks Programme. Diakses 21 Agustus 2026, dari
<https://www.unesco.org/en/igpp/kebumen-unesco-global-geopark>

GeoTrack Karangsambung : Pengembangan Wisata Berbasis Edukasi Geosite di Geopark Kebumen

¹Nabila Yuliana Putri, ²Dian Arla Zahwa Adinda,

³Nor Arisha Natasha

¹²Universitas Sebelas Maret, ³Universiti Putra Malaysia

Pendahuluan

Karangsambung dan kawasan pesisir selatan Kebumen memiliki keragaman geologi yang menjadikannya penting untuk kegiatan pendidikan, penelitian, dan pengembangan geowisata. Yunarto & Munasri (2005) menjelaskan bahwa kawasan Karangsambung memiliki keragaman batuan dan sejumlah lokasi yang memiliki nilai perlindungan, sehingga kawasan ini telah lama dimanfaatkan untuk kegiatan pendidikan dan penelitian kebumian. Potensi tersebut semakin diperkuat dengan ditetapkannya Kebumen sebagai UNESCO Global Geopark pada 2025 (UNESCO, 2025). Dalam konsep UNESCO Global Geopark, warisan geologi tidak hanya dipandang sebagai objek wisata, tetapi juga memiliki fungsi dalam pendidikan, konservasi, dan pembangunan berkelanjutan dengan melibatkan masyarakat lokal. Hal tersebut sejalan dengan konsep geowisata yang menempatkan pemahaman terhadap proses dan sejarah geologi sebagai bagian dari pengalaman wisata (Ansori et al., 2016).

Keragaman tersebut memberikan peluang untuk mengembangkan pengalaman wisata geologi yang lebih terarah dan interaktif melalui konsep GeoTrack

Karangsambung. Gagasan ini terinspirasi dari pengembangan geotrack di Yogyakarta, di mana Ali et al. (2021) mengidentifikasi jalur perjalanan berdasarkan sejumlah situs yang memiliki potensi untuk dikembangkan sebagai objek geowisata. Dengan pendekatan serupa, GeoTrack Karangsambung diusulkan dalam dua pilihan rute, yaitu rute utara yang menghubungkan BRIN Karangsambung, Gunung Parang, Totogan, Pucangan, dan Watu Kelir serta rute selatan yang menghubungkan Taman Geowisata Karangbolong, Pantai Karangbolong, Pantai Surumanis, Pantai Pecaron, dan Pantai Menganti. Kedua rute tersebut dirancang untuk memperkenalkan keragaman batuan dan bentang alam Kebumen melalui perjalanan yang disertai pemanduan dan storytelling. Dalam pelaksanaannya, komunitas lokal dapat menjadi bagian dari pendampingan wisata, sementara terdapat pemandu profesional untuk menjelaskan mengenai geologi. Dengan demikian, wisatawan tidak hanya berkunjung untuk menikmati pemandangan, tetapi juga memperoleh pemahaman mengenai batuan, proses pembentukannya, serta pentingnya menjaga warisan geologi.

Isi

GeoTrack Karangsambung dirancang sebagai perjalanan wisata edukasi geologi yang menggabungkan pemanduan, storytelling geosite, pengalaman langsung, hingga geo-souvenir yang berisi oleh-oleh khas Kabupaten Kebumen seperti Lanting, Gula Semut, dan Batik Kebumen sebagai upaya untuk mendukung UMKM lokal yang berkelanjutan. Pemandu yang bertugas disini harus memahami secara menyeluruh terkait sejarah dan batuan apa saja yang ada di

Kebumen sehingga *storytelling* yang diberikan dapat menambah wawasan wisatawan.

Alur perjalanan GeoTrack Karangsambung dirancang dalam dua rangkaian perjalanan darat yaitu rute utara melalui BRIN Karangsambung sebagai titik kumpul awal, kemudian dilanjutkan menuju Gunung Parang, Totogan, Pucangan, dan Watu Kelir, lalu ada rute selatan yang dimulai dari titik kumpul Taman Geowisata Karangbolong, Pantai Karangbolong, Pantai Sirumanis, Pantai Pecaron, hingga Pantai Menganti.

Untuk memudahkan wisatawan, transportasi antar lokasi dapat dimasukkan sebagai bagian dari paket perjalanan melalui kerja sama antara pemerintah daerah, dan penyedia jasa transportasi lokal. Kendaraan yang digunakan dapat disesuaikan dengan jumlah peserta serta kondisi akses menuju masing-masing lokasi, sehingga wisatawan tidak perlu mengatur transportasi secara mandiri. Skema ini juga dapat membuka peluang tambahan bagi komunitas lokal sekaligus mendukung pengelolaan perjalanan wisata yang lebih terkoordinasi.

Rute Utara



Gambar Skema GeoTrack Karangsambung Rute Utara

Sumber: Penulis, 2026

- BRIN Karangsambung (Lokasi Pertama/Titik kumpul)
Panduan Geowisata BRIN menjelaskan Karangsambung sebagai kawasan geologi yang dapat dimanfaatkan untuk pendidikan, dan geowisata (JDIH BRIN, 2025). Wisatawan memulai perjalanan di BRIN sebagai titik kumpul. Guide memberikan pengantar mengenai sejarah geologi Karangsambung, proses terbentuknya kawasan, serta jenis-jenis batuan yang akan ditemui selama perjalanan.
- Gunung Parang (Lokasi Kedua)
Perjalanan dilanjutkan ke Gunung Parang untuk melihat batuan diabas dengan struktur kekar kolom atau *columnar joint*. Batuan Diabas adalah batuan mafik, holokristalin, dan subvulkanik yang setara dengan basalt vulkanik atau gabro plutonik yang berbutir halus

hingga sedang yang memiliki warna abu-abu dan hitam (Kudo, A. M., 2026). Pemandu menjelaskan proses pendinginan batuan dan bagaimana struktur tersebut dapat terbentuk.

c. Totogan (Lokasi Ketiga)

Formasi Totogan Karangsambung tersusun oleh kelompok sedimen yang tercampur aduk karena proses pelongsoran gaya berat yang dikenal dengan istilah Olistostrome. Bongkah-bongkah batuan sedimen berukuran centimeter hingga ratusan meter tersebar secara acak dalam masadasar lempung hitam bersisik (*scaly clay*), batuan sendimen, basalt atau lava bantal, dan marmer (Mareta, N., Anshori, C., 2020). Pada lokasi ini, Pemandu menjelaskan secara rinci terkait sejarah terbentuknya dan menunjukkan masing-masing batuan yang ada.

d. Pucangan (Lokasi Keempat)

Berbeda dengan lokasi-lokasi lain yang memiliki banyak jenis batuan. Pucangan hanya memiliki satu jenis batuan yaitu singkapan Serpentininit (Geografi UMP, 2024). Batuan ini merupakan jenis batuan metamorf dan merupakan penyusun kerak samudra yang sebagian besar tersusun oleh satu atau lebih mineral dari kelompok serpentininit yang meliputi antigorit, lizardit, dan krisotil (Haldar, S. K, 2020).

e. Watu Kelir (Lokasi Kelima)

Perjalanan terakhir wisatawan menuju Watu Kelir untuk mengamati langsung rijang, batugamping merah, dan lava bantal (Izzah, 2025). Pemandu menggunakan metode storytelling untuk menjelaskan bagaimana batuan

tersebut terbentuk dan kaitannya dengan lingkungan laut purba sehingga dapat memberi gambaran bagi para wisatawan yang hadir.

Rute Selatan



Gambar Skema GeoTrack Karangsambung Rute Selatan

Sumber: Penulis, 2026

a. Taman Geowisata Karangbolong (Lokasi Pertama/Titik Kumpul)

Titik kumpul awal dan pengenalan geologi pesisir selatan Kebumen. Pemandu akan menyambut peserta di area batuan koleksi dari Geowisata Karangbolong, lalu membuka wawasan mengenai pentingnya menjaga kelestarian warisan geologi (*geological heritage*). Pemandu akan memperkenalkan batuan tersebut sebagai pengantar singkat agar peserta mendapat gambaran

- bentuk dan jenis batuan purba yang nantinya akan ditemui secara langsung di sepanjang rute pesisir.
- b. Pantai Karangbolong (Lokasi Kedua)

Pantai Karangbolong didominasi oleh batuan unik yang tersusun atas breksi vulkanik, berkontur landai, berpasir yang cukup luas, yang dibatasi oleh perbukitan batuan sedimen klastik yang berasal dari gunung api. Menurut Wikipedia, breksi yang dikenal sebagai formasi gabon ini berumur oligo-miosen atau sekitar 30 sampai 15 juta tahun lalu, tersingkap bersama-sama dengan sisipan batu pasir dan batu lempung. Pemandu akan menjelaskan proses alam yang dahsyat di balik terbentuknya gua karangbolong.
 - c. Pantai Surumanis (Lokasi Ketiga)

Pantai Surumanis terbentuk dari perpaduan dua formasi batuan penting, yaitu batuan vulkanik Formasi Gabon dan batugamping dari Formasi Kalipucang. Pemandu akan mengedukasi wisatawan tentang bagaimana perbedaan tingkat kekerasan dan ketahanan antara batuan vulkanik dan batugamping merespons erosi air laut, sehingga menciptakan bentuk bentang alam pesisir yang sangat bervariasi.
 - d. Pantai Pecaron (Lokasi Keempat)

Pantai Pecaron memiliki karakteristik geologi yang ditandai oleh dominasi breksi vulkanik yang bercampur dengan bongkahan batuan beku serta lapisan batugamping. Pemandu akan menceritakan sejarah aktivitas vulkanisme masa lalu yang memuntahkan material piroklastik hingga membentuk breksi, serta

bagaimana bongkahan batuan beku tersebut terlihat dengan jelas di kawasan pesisir Pecaron.

e. Pantai Menganti (Lokasi Terakhir)

Pantai Menganti memiliki batuan yaitu lava basalt sebagai bukti adanya erupsi gunung api purba pada puluhan juta tahun silam (Darmawan, L. 2020). Menurut SiagaBencana, batuan lava basalt ini terbentuk dekat dengan jalur subduksi atau dekat dengan batas penunjaman lempeng dengan komposisi silica dan potassium yang cukup rendah. Sedangkan struktur dari batuan tersebut adalah struktur kolom atau *columnar joint* yang berbentuk pilar, seolah-olah batu yang terbentuk secara alami. Pemandu akan menutup perjalanan dengan menerangkan pendinginan lambat dari lava pijar purba yang membentuk tiang-tiang basalt berkolom rapi secara alami.

Rute Utara dan Rute Selatan dengan demikian memberikan urutan pembelajaran bagi wisatawan sehingga mereka dapat melihat keragaman batuan sekaligus memahami bahwa batuan di Karangsambung terbentuk dari lingkungan dan proses geologi yang berbeda. Konsep GeoTrack Karangsambung dapat memperkuat hubungan antara geologi dan ekonomi masyarakat. Geopark dapat mendukung pembangunan berkelanjutan melalui keterlibatan masyarakat lokal, budaya, kerajinan, dan aktivitas ekonomi yang tetap menjaga warisan geologi (Unesco, 2026). Selain itu unsur *local culture, knowledge, involvement*, dan *novelty* berpengaruh signifikan terhadap niat wisatawan untuk berkunjung kembali (Riptiono, 2022).

GeoTrack Karangsambung membuka ruang yang lebih besar bagi komunitas lokal untuk berperan sebagai penyedia pengalaman wisata, dan pelaku UMKM. Aktivitas ekonomi tidak hanya berpusat pada tiket masuk, tetapi dapat berkembang melalui jasa pendamping, *workshop*, dan adanya produk geo-souvenir sebagai ikon Kabupaten Kebumen. Nilai geosite terletak pada keberadaan batuan dan proses geologi yang dapat dipelajari. Karena itu, pengembangan wisata tidak boleh mengurangi objek yang menjadi sumber pembelajaran tersebut (Darmawan, K., et al, 2022). Pengalaman wisata harus diarahkan pada prinsip semakin wisatawan memahami cerita geologinya.

Penutup

Konsep GeoTrack Karangsambung menawarkan gagasan pengembangan wisata edukasi dengan menghubungkan dua rute yaitu Rute Utara melalui BRIN Karangsambung, Gunung Parang, Totogan, Pucangan, dan Watu Kelir dalam satu perjalanan yang memiliki alur cerita geologi, mulai dari pengenalan kawasan, pemahaman lingkungan laut purba melalui batuan di Watu Kelir, hingga pengenalan batuan diabas dengan struktur *columnar joint* di Gunung Parang. Sedangkan Rute Selatan yaitu Taman Geowisata Karangbolong, Pantai Karangbolong, Pantai Surumanis, Pantai Pecaron, dan Pantai Menganti. Rute Selatan memiliki alur edukasi dari batuan vulkanik dan bentang alam Karangbolong, pertemuan batuan vulkanik karbonat di Surumanis dan Pecaron, hingga basalt berstruktur *columnar joint* di Menganti. Konsep ini masih berupa usulan pengembangan sehingga pelaksanaannya memerlukan

koordinasi dengan pengelola Geopark Kebumen, BRIN, pengelola Taman Geowisata Karangbolong, pemerintah daerah, komunitas lokal, serta pihak yang memahami geologi dan konservasi. Dengan pendampingan yang tepat, penyampaian informasi yang akurat, pengalaman wisata yang aman, dan pengembangan geo-souvenir sebagai buah tangan atau oleh-oleh khas dari Kabupaten Kebumen GeoTrack diharapkan dapat membuat kunjungan wisata lebih edukatif sekaligus membuka peluang bagi masyarakat lokal. Pada akhirnya, wisatawan tidak hanya datang untuk melihat batu, tetapi juga memahami bagaimana batuan tersebut terbentuk, bagaimana kaitannya dengan sejarah bumi, serta mengapa keberadaannya perlu dijaga.

Referensi

- Ali, R. K., Qadaryati, N., & Kurniawan, W. (2021). *"Analisis Penilaian Situs Geologi Sebagai Peluang Pengembangan Geowisata di Kabupaten Bantul, Daerah Istimewa Yogyakarta."* Jurnal Ilmiah Pariwisata, 26(1), 70-85. <https://doi.org/10.30647/jip.v26i1.1443>
- Ansori, C., Kumoro, Y., Hastria, D., & Widiyanto, K. (2016). *Panduan Geowisata: Menelusuri Jejak Dinamika Bumi pada Rangkaian Pegunungan Serayu dan Pantai Selatan Jawa*. LIPI Press (Penerbit BRIN). ISBN 978-979-799-863-9.
- Darmawan, L. (January 19, 2020). *Menikmati Keindahan Pantai Selatan, dari Geowisata hingga Konservasi Penyusung Lekang*. Mongabay. <https://mongabay.co.id/2020/01/19/menikmati->

keindahan-pantai-selatan-dari-geowisata-hingga-konservasi-penyu-lekang/

Darmawan, K. K., & Rahmawati, P. I. (2022). *Pengembangan Potensi Wisata Alam Desa Cau Belayu*. Jurnal Manajemen Perhotelan Dan Pariwisata, 5(1), 49-56.
<https://doi.org/10.23887/jmpp.v5i1.35485>

Halдар S. K, (2020). *Introduction to Mineralogy and Petrology*. Science Direct.
<https://www.sciencedirect.com/book/monograph/9780128205853/introduction-to-mineralogy-and-petrology>

Izzah, F. N. (April 27, 2025). *Karangsambung di Kebumen Jadi Laboratorium Alam untuk Belajar Geografi*.
<https://www.goodnewsfromindonesia.id/2025/04/27/karangsambung-di-kebumen-jadi-laboratorium-alam-untuk-belajar-geografi>

JDIH BRIN (April 25, 2025). *Karangsambung Jadi Laboratorium Alam untuk Pembelajaran Geografi Mahasiswa*.
<https://www.brin.go.id/news/122781/karangsambung-jadi-laboratorium-alam-untuk-pembelajaran-geografi-mahasiswa>

Kajian Kolaborasi Pengembangan Geotourism dan Potensi Lokal: Studi Kasus Desa Sadang sebagai Bagian Geopark Nasional Karangsambung-Karangbolong. Prosiding Seminar Nasional Kebumian UGM. Kajian ini memuat penilaian geosite Watu Kelir serta karakteristik rijang, batugamping merah, dan lava bantal.

Kudo, A. M, (July 24, 2026). *Diabase Rock Also known as: dolerite.* Britannica.

<https://www.britannica.com/science/diabase>

Mareta, N., Ansori, C. (2020). *KAJIAN GEOLOGI BAWAH PERMUKAAN FORMASI KARANGSAMBUNG SERTA FORMASI TOTOGAN DAN HUBUNGANNYA DENGAN AKUIFER AIRTANAH DI DESA KALISANA KABUPATEN KEBUMEN.* Buletin Of Scientific Contribution Geology. Vol 18 (1). <https://doi.org/10.24198/bsc.v18i1.26531>

Nur, A. M. (2011). *Kajian Geologi Lingkungan pada Lokasi Penambangan Batuan Diabas Gunung Parang dalam Rangka Konservasi Batuan di Cagar Alam Geologi Karangsambung.* Teknik, 32(2). Kajian ini menegaskan pentingnya konservasi diabas Gunung Parang dan struktur columnar joint.

Pemerintah Kabupaten Kebumen. Informasi mengenai Geopark Kebumen, Watu Kelir, serta kekayaan geologi kawasan.

[Website Resmi Pemerintah Kabupaten Kebumen](#)

Pemerintah Kabupaten Kebumen. *Perlindungan dan Pengelolaan Taman Bumi (Geopark) Karangsambung-Karangbolong*, termasuk daftar geosite dan Columnar-jointed diabase Gunung Parang. [Dokumen JDIH Kabupaten Kebumen](#)

Riptiono, S. (2022). *Menguji memorable tourism experiences terhadap niat kunjung ulang wisatawan pada Geopark di Kebumen.* Jurnal Manajemen Kewirausahaan, 19(02), 111-122. <http://dx.doi.org/10.33370/jmk.v19i1.941>

- Siaga Bencana. *Pantai Menganti Menyimpan Segudang Jejak Gunung Purba*. <https://siagabencana.com/pantai-menganti-menyimpan-segudang-jejak-gunung-purba/>
- UNESCO. (2025). *UNESCO names 16 new Global Geoparks*. <https://www.unesco.org/en/articles/unesco-names-16-new-global-geoparks>
- UNESCO (August 20, 2026). UNESCO Global Geoparks. <https://www.unesco.org/en/igpp/geoparks/about>
- Universitas Muhammadiyah Purwokerto (January 19, 2024). *Perkaya Wawasan Geologi, Mahasiswa Pendidikan Geografi UMP Kunjungi Geopark Karangsambung*. <https://pend-geografi.ump.ac.id/perkaya-wawasan-geologi-mahasiswa-pendidikan-geografi-ump-kunjungi-geopark-karangsambung/>
- Yunarto, Y. (2005). *Sistem Informasi Kebumihan sebagai Sarana Penyediaan Informasi Geologi Daerah Karangsambung*. Riset Geologi dan Pertambangan, 15(1).

Augmented Reality for Sustainable Geotourism: Transforming Visitor Engagement at Kebumen Geopark

¹Kaeisya Zalfa Hafrizza, ²Ighfirly Nadin Shodiqqi,

³Putih Iskandar, ⁴Nur Yasmin Sofea

¹²³Universitas Sebelas Maret, ³⁴Universiti Putra Malaysia

Pendahuluan

KEBUMEN Geopark atau dijuluki sebagai *"The Mother of Earth"* merupakan kawasan konservasi geologi yang perjalanan pembentukannya telah dimulai sejak tahun 2004, ketika Pemerintah Indonesia menetapkan Kawasan Bentang Alam Karst Gombang Selatan sebagai kawasan pembangunan berkelanjutan pada 2006, dan diperkuat pada 2018 melalui penetapan status Geopark Nasional, hingga akhirnya pada April 2025 resmi diakui sebagai UNESCO Global Geopark. Kawasan yang membentang di 22 kecamatan ini menyimpan potensi wisata yang sangat besar, kurang lebih terdapat 42 situs geologi (*geosite*), termasuk 13 di antaranya bernilai internasional, mulai dari Goa Jatijajar, geologi Karangsambung-Karangbolong. Sayangnya, kekayaan geologi ini belum sepenuhnya berbanding lurus dengan pendapatan sektor pariwisata daerah, menurut satu data kabupaten kebumen pendapatan retribusi/pariwisata tercatat angka Rp5,57 miliar (Pekab Kebumen, 2025). Di sisi yang lain, rata-rata lama wisatawan tinggal di Kebumen masih tergolong singkat, yakni 1,1 hari (BPS Kebumen, 2025). Kondisi ini menimbulkan pertanyaan mendasar: Jika kekayaan

geologi Kebumen sedemikian melimpah, mengapa wisatawan justru enggan berlama-lama menikmatinya?

Isi

Permasalahan tersebut menunjukkan bahwa selain fokus pada kuantitas (peningkatan jumlah wisatawan), Kebumen Geopark juga perlu melakukan strategi pengembangan yang dapat meningkatkan kualitas daya tarik wisatawan sehingga peluang wisatawan untuk tinggal lebih lama di lokasi wisata semakin besar (Munif dkk, 2025). Padahal pengalaman berkesan yang diperoleh wisatawan saat berkunjung ke destinasi wisata juga mempengaruhi kenyamanan wisatawan sekaligus menunjang mereka untuk berlama-lama menikmati destinasi wisata yang dikunjungi (Amir dkk, 2025). Sayangnya, hal tersebut belum bisa dihadirkan, potensi yang dimiliki Kebumen belum diimbangi dengan interpretasi wisata yang baik. Cerita geologis dan narasi ilmiah yang dimiliki Kebumen, mulai dari kerak samudra purba di Karangsambung, Gua Jatijajar, hingga bentang alam karang bolong padahal menarik, namun belum menampilkan keutuhan narasi yang mengesankan. Kesenjangan antara kekayaan geologi dan kemampuan interpretasi ini membuat wisatawan cenderung hanya sekedar melihat tanpa memahami proses dibalikinya, sehingga pengalaman yang diperoleh terasa kurang berkesan.

Merujuk pada data Disbudparekraf, Kabupaten Kebumen sebenarnya tidak kalah saing dibandingkan dengan daerah lain di Jawa Tengah, posisi kunjungan wisata Kebumen cukup prestisius dengan 675.348 wisatawan menempati posisi teratas kabupaten/kota paling ramai dikunjungi di Jawa Tengah, kemudian Kabupaten Klaten menjadi urutan kedua

dengan jumlah 555.460 kunjungan, serta Kabupaten Wonosobo sebagai urutan ketiga dengan 530.150 kunjungan. Data ini menunjukkan bahwa Kebumen tidak kekurangan wisatawan, melainkan kekurangan alat untuk memperdalam interaksi mereka dengan kekayaan geologi setempat. Berdasarkan penelitian yang dilakukan oleh Adiatma dkk (2025), AR terbukti menjadi inovasi yang dapat meningkatkan pemahaman dan ketertarikan wisatawan terhadap destinasi wisata, sehingga menjadikannya peluang nyata untuk meningkatkan daya tarik wisatawan Kebumen Geopark.

Potensi ini didukung oleh riset pasar tur virtual global yang pada tahun 2023 bernilai 0,96 miliar dolar AS dan diprediksi akan mencapai 17,88 miliar dolar AS pada tahun 2035. Hal ini juga didukung oleh tingkat pertumbuhan tahun majemuk (CAGR) sebesar 27,9% dari tahun 2024 hingga 2035. Penelitian lain menunjukkan bahwa 56,7% responden merasa tertarik untuk mengunjungi lokasi wisata secara langsung setelah berinteraksi melalui simulasi AR, dan sebanyak 88,7% sepakat bahwa fitur AR membantu dalam memvisualisasikan pariwisata yang begitu rumit (Marvella dkk, 2023). Dengan adanya potensi ini, penerapan AR di Kebumen Geopark berpeluang menjadi solusi yang tidak hanya memperkaya pengalaman edukatif wisatawan, tetapi juga mendorong keterlibatan yang lebih dalam terhadap nilai konservasi geologi kawasan ini.

Augmented Reality (AR) dalam dunia pariwisata merujuk pada dunia digital dan elemen virtual ke dalam lingkungan dunia nyata melalui teknologi canggih. Pendekatan inovatif ini meningkatkan pengalaman

perjalanan secara keseluruhan dengan menempatkan data kontekstual, alat bantu visual, dan elemen interaktif di atas lingkungan fisik. Penerapan AR dalam perjalanan dan pariwisata mencakup berbagai skenario, mulai dari tur virtual dan navigasi hingga gamifikasi. Teknologi AR memungkinkan wisatawan untuk menjelajahi destinasi dengan cara yang sepenuhnya baru, memberikan informasi real-time tentang tempat-tempat menarik, serta situs bersejarah dengan hanya mengarahkan perangkat pintar mereka ke lokasi tertentu, wisatawan dapat mengakses penjelasan rinci, model 3D, dan konten multimedia yang menghidupkan lingkungan sekitar. Dengan memberikan pengalaman yang diperkaya dengan akses tersebut, pemanfaatan AR dalam Kebumen Geopark dapat meningkatkan daya tarik wisatawan, memperkenalkan lebih dalam mengenai budaya dan sejarah hingga berdampak positif terhadap keberlanjutan lingkungan (Yuniarto dkk, 2023)

Inovasi AR terdiri dari empat komponen utama yang saling melengkapi. Komponen yang pertama adalah AR Mobile Application, yaitu aplikasi berbasis kamera ponsel yang memungkinkan wisatawan untuk mengarahkan perangkatnya ke lanskap bebatuan atau geologi. Melalui teknologi ini, sejarah geologis yang sebelumnya hanya berupa teks pada papan informasi dapat dihadirkan sebagai visualisasi tiga dimensi dan narasi interaktif secara *real time*, sehingga wisatawan tidak lagi sekadar melihat bebatuan saja, tetapi juga memahami bagaimana proses tektonik dan evolusi bumi membentuknya. Komponen kedua yaitu VR Virtual Tours yang dirancang untuk menjangkau calon wisatawan yang berada jauh dari lokasi, dengan pengalaman

360° calon pengunjung dapat menjelajahi geosite secara virtual. Fitur ini berfungsi sebagai media promosi yang memperluas visibilitas Kebumen Geopark ke ranah global.



Gambar Skema AR Mobile Applications dan VR

Sumber: Penulis, 2026

Komponen ketiga yaitu AR Navigation, komponen ini menghadirkan peta geosite yang dilengkapi dengan audio multibahasa. Navigasi ini berfungsi sebagai penunjuk arah kepada wisatawan, sehingga wisatawan dapat menjelajahi kawasan geopark secara lebih efisien tanpa bergantung sepenuhnya kepada pemandu wisata. Komponen keempat yaitu Edu Tourism Mode, fitur ini menghadirkan bagaimana materi geologi dikemas dalam format gamifikasi, sehingga proses belajar tentang kebumen dapat berlangsung secara menyenangkan dan interaktif.



Gambar Skema AR Navigation dan Edu Tourism Mode

Sumber: Penulis, 2026

Keempat komponen AR tersebut membentuk satu alur pengalaman wisata yang saling terhubung, mulai dari perencanaan melalui Virtual Tours, eksplorasi di lokasi melalui AR Mobile Application dan AR Navigation, hingga pembelajaran melalui Edu Tourism Mode. Pengalaman interaktif ini berpotensi mendorong wisatawan membagikan pengalamannya ke media sosial, sehingga memperluas kesadaran global terhadap kekayaan geologi Kebumen. Dengan begitu, penerapan AR tidak hanya memperdalam dan pengalaman wisatawan, tetapi juga membuka peluang ekonomi bagi masyarakat sekitar serta memperkuat konservasi jangka panjang kawasan geopark.

Penutup

Kekayaan geologi yang dimiliki oleh Kebumen Geopark telah menjadi keunggulan sekaligus identitas pariwisata Kebumen. Namun, potensi yang sangat besar tersebut masih mendapati tantangan dalam mengubah kekayaan geologi menjadi pengalaman wisata yang lebih

mendalam, edukatif, dan berkesan. Besarnya angka kunjungan wisatawan belum sepenuhnya menunjukkan bahwa geosite sebagai daya Tarik utama geopark telah menjadi tujuan wisata edukatif secara optimal. Oleh karena itu, diperlukan pengembangan pariwisata Kebumen Geopark yang perlu diarahkan tidak hanya pada peningkatan jumlah wisatawan, tetapi juga mencakup bagaimana wisatawan dapat memahami, berinteraksi, dan membangun keterikatan terhadap nilai geologi yang dimiliki oleh suatu wilayah tersebut.

Untuk menanggapi konteks tersebut, penerapan *Augmented Reality* (AR) dapat menjadi salah satu cara yang inovatif untuk menambah pengalaman wisatawan terhadap nilai geologi Kebumen Geopark sekaligus membantu wisatawan memahami informasi geologi yang cukup kompleks. Melalui AR Mobile Application, VR Virtual Tours, AR Navigation, dan Edu Tourism Mode, wisatawan dapat mengenal *geosite* sebelum berkunjung, memperoleh informasi saat sedang berada di lokasi, sekaligus mempelajari sejarah atau proses geologi melalui tampilan baru yang lebih menarik dan interaktif. Agar penerapan tersebut dapat berjalan secara optimal, pemerintah daerah perlu mendukungnya melalui kebijakan pengembangan pariwisata berbasis teknologi, seperti penyediaan infrastruktur digital di kawasan geosite, pengembangan konten AR yang bekerja sama dengan ahli geologi dan pengelola geopark, serta melibatkan masyarakat lokal dalam pengelolaan dan pengembangan layanan wisata. Dengan adanya dukungan tersebut, AR tidak hanya menjadi teknologi tambahan dalam kegiatan wisata, tetapi dapat menjadi media interpretasi yang

membuat perjalanan di Kebumen Geopark lebih dimaknai, informatif, interaktif, dan edukatif, sekaligus mendukung upaya peningkatan ekonomi masyarakat dan konservasi geosite secara berkelanjutan.

Referensi

- Adiatma, D., Susilawati, W., & Muminin, R. S. (2025). Menuju *branding* pariwisata berkelanjutan: Integrasi AR, pemasaran *influencer*, dan partisipasi komunitas dalam promosi destinasi. *Journal of Economics and Business UBS*, 14(4), 976–991. <https://doi.org/10.52644/joeb.v14i4.2787>
- Allied Market Research. (2024). *Virtual tour market by type and application: Global opportunity analysis and industry forecast*, 2024–2035. <https://www.alliedmarketresearch.com/virtual-tour-market-A15786>
- Amir, S., Astuti, W., & Chandrarin, G. (2025). *Citra destinasi & pengalaman wisata berkesan: Berkunjung ke 4 destinasi ekowisata Jawa Timur: Taman Nasional Bromo Tengger Semeru, Baluran, Alas Purwo, dan Meru Betiri*. Uwais Inspirasi Indonesia.
- Badan Pusat Statistik Kabupaten Kebumen. (2025, November 12). *Perkembangan pariwisata di Kabupaten Kebumen September 2025* [Siaran pers]. <https://kebumenkab.bps.go.id/id/pressrelease/2025/11/12/382/perkembangan-pariwisata-di-kabupaten-kebumen-september-2025.html>

- Marvella, M., Hakim, N. A., Seciawanto, P. A., & Chowanda, A. (2023). Implementation of augmented reality in Android-based tourism applications to promote Indonesian tourism. *Procedia Computer Science*, 227, 573–581. <https://doi.org/10.1016/j.procs.2023.10.560>
- Munif, F., Frisiska, & Darwani, L. (2025). Strategi pengembangan daya tarik wisata dalam meningkatkan kunjungan wisatawan lokal di Kota Tua Jakarta. *Jurnal Bisnis dan Ekonomi*, 3(4), 495–509. <https://doi.org/10.61597/jbe-ogzrp.v3i4.144>
- Pemerintah Kabupaten Kebumen. (2025). *Satu Data Kabupaten Kebumen: Statistik sektoral*. https://satudata.kebumenkab.go.id/v2/index.php/web/data_sektoral/2025/2025/26
- Rahmawati, E. D., Setiyani, R., Janah, A. A., Subagyo, R., & Nurkhasanah. (2025). Kualitas layanan dan kepuasan wisatawan sebagai penentu niat kunjungan ulang: Studi pada wisata Geopark Kebumen. *Prosiding Seminar Nasional Pembangunan Ekonomi Berkelanjutan dan Riset Ilmu Sosial*, 2(1), 60–66. <https://ejurnal.teraskampus.id/index.php/simetris/article/view/358>
- Verified Market Research. (2025). *Augmented reality in travel and tourism market size, share & forecast*. <https://www.verifiedmarketresearch.com/product/augmented-reality-in-travel-and-tourism-market/>
- Yobelin, C., Mujtaba, H., Hellyani, C. A., & Triwijayati, A. (2026). Identifikasi klaster pemanfaatan *augmented reality* dalam pengembangan pariwisata di Indonesia.

Ebisnis Manajemen, 4(2), 27–42.
<https://doi.org/10.59603/ebisman.v4i2.1367>

Yuniarto, D., & Helmiawan, M. A. (2023). Penerapan *augmented reality* pengenalan monumen sebagai upaya pariwisata berkelanjutan. *Infoman's: Jurnal Ilmu-Ilmu Informatika dan Manajemen*, 17(2), 1–11.
<https://ejournal.unsap.ac.id/index.php/infomans/article/view/1020>

Appendix A

Photographic Documentation

Symposium (7th May, 2026)



Picture Attendees of the symposium, featuring the Regent, Lilis Nuryani in the center, held at the Luk Ulo Auditorium, Karangsembung Geology Campus, Kebumen.



Picture A speaker responding to a participant's question during the Q&A session.

Symposium (7th May, 2026)



Picture A symposium participant engaging with the speaker during the question-and-answer session.

Field Trip (8th – 9th May, 2026)



Picture Participants gathering at the BRIN Karangsambung Research Center.



Picture Participants observing the Exotic-blocks of serpentinite of Pucangan in Sadang Regency

Field Trip (8th – 9th May, 2026)



Picture Participants exploring the Exotic-blocks of pillow-lava and radiolarian chert of Muncar River in Sadang District.



Picture Participants learning about handicraft production from banana stem fibers at Agrominafiber

Field Trip (8th – 9th May, 2026)



Picture Participants observing the traditional production of Sokka roof tiles, a registered Geographical Indication product of Kebumen Regency.



Picture Participants learning the traditional batik-making process at Sekar Jagad, Gemeksekti Village.

Gala Dinner (9th May, 2026)



Picture Group photo of the Summer School participants with Kebumen Regent Lilis Nuryani and Vice Regent Zaeni Miftah.



Picture Group photo with Kebumen Regent Lilis Nuryani and the Lawet dancers.

Gala Dinner (9th May, 2026)



Picture Participants enjoying the Gala Dinner that held as part of the Summer School program.

Menganti Beach (10th May, 2026)



Picture Participants visiting Menganti Beach in Ayah District, Kebumen Regency, Indonesia.

Appendix B

Posters



Authors: Alam Fajar Rohman (Public Administration, Universitas Sebelas Maret), Izaaz Akbar Ashidqi (Public Administration, Universitas Sebelas Maret), Umi Nurrokhmah (Management, Universitas Putra Bangsa), Nor Syazlin Binti Ishak (Human Communication, Universiti Putra Malaysia), Nurul Izzati Binti Mazlan (Anthropology and Sociology, Universiti Kebangsaan Malaysia), Sitara Batool (Human Resource, Universitas Diponegoro)



Authors: Ighfirly Nadin Shodiqqi (Public Administration, Universitas Sebelas Maret), Putih Iskandar (Public Administration, Universitas Sebelas Maret), Kaeisya Zalfa Hafrizza (Public Administration, Universitas Sebelas Maret), Nor Arisha Natasha Binti Mustapar (Human Communication, Universiti Putra Malaysia), Hafizh Muhammad Uzair (Masters in Aquaculture, Universitas Brawijaya), Muhammad Rehan Sabir (English Education, Universitas Muhammadiyah Surakarta)



Authors: Alya Nur Syafa (Public Administration, Universitas Sebelas Maret), Elsa Nurhandayani (Public Administration, Universitas Sebelas Maret), Noval Al Asfa (Diploma in Accounting, Politeknik Piksi Ganesha Indonesia), Amira Sofea (Human Communication, Universiti Putra Malaysia), Nur Anis Amalina (Institute of Ethnic Studies, Universiti Kebangsaan Malaysia), Muhammad Saif (English Education, Universitas Muhammadiyah Surakarta), Amjad Jabbar (Master of Communication Science, UPN "Veteran" Yogyakarta)



Authors: Regina Cahya Dianingsih (Public Administration, Universitas Sebelas Maret), Qonita Rahma Aulia (Public Administration, Universitas Sebelas Maret), Naswa Maurena Ambar Pradani (English Education, Universitas Ma'arif Nahdlatul Ulama Kebumen), Nur Yasmin Sofea (Corporate Communication, Universiti Putra Malaysia), Hassan Bashir (Agricultural Science, Universitas Sebelas Maret), Mounir Naili (Islamic Studies, Universitas Islam Negeri Saifuddin Zuhri Purwokerto)



Authors: Nabila Yuliana Putri (Public Administration, Universitas Sebelas Maret), Dian Arla Zahwa Adinda (Public Administration, Universitas Sebelas Maret), Tifara Adila Prastiwi (Midwifery, Universitas Muhammadiyah Gombong), Auni Alyaa (Human Communication, Universiti Putra Malaysia), Mohamed Jifry Mohamed Mahsoom (Civil Engineering, Nusa Putra University), Muhammad Aarif (Masters in Public Policy and Administration, Universitas Gadjah Mada)

GERAKAN 1000 ARTIKEL

- SPECIAL EDITION -

*Summer School on Kebumen UNESCO Global
Geopark Geoconservation 2026*



summer school
Geoconservation of Kebumen Geopark

BADAN PERENCANAAN PEMBANGUNAN,
RISET DAN INOVASI DAERAH
KABUPATEN KEBUMEN