



## Geodiversity as a Driver of Tourism: A study of Sri Lankan Geological Heritage

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### Abstract

Tourism development is increasingly recognising geodiversity, which encompasses a variety of geological formations, landforms, and associated ecosystems, as a critical factor. Using a qualitative approach, this research study examined how geodiversity serves as a pull motivation for tourists, shapes their perceptions, and plays a role in the activities and experiences associated with geotourism. Data were collected through in-depth interviews had with tourists who were selected using purposive and snowball sampling, and those collected data were analysed using thematic analysis technique to uncover key insights. The findings revealed that the geodiversity of Sri Lanka is a significant motivational factor for tourists, offering unique geological features such as Adam's Peak, Horton Plains, and Sigiriya, which integrate natural beauty with cultural narratives. During the data analysis, it was observed that tourists highlighted strong emotional connections to these sites, with awe and wonder emerging as recurring themes. However, the study also identifies gaps in tourists' pre-visit awareness, highlighting the need for targeted educational and promotional initiatives. Further, geodiversity enables a range of activities, varying from adventure tourism and ecotourism to cultural exploration, while enhancing the overall tourist experience. This study pointed out the potential of geodiversity to diversify the tourism offering of Sri Lanka, attract niche markets, and promote sustainable development. Key recommendations include improving geoconservation practices, leveraging digital marketing and visual storytelling, and fostering collaborative efforts among stakeholders. By aligning geotourism strategies with global sustainable goals, Sri Lanka can position itself as a premier geotourism destination. The research contributes to the wide understanding of geotourism by exploring how geodiversity can be managed effectively and integrated into tourism planning and development. It also highlights the importance of balancing economic benefits with ecological and cultural preservation.

**Keywords:** *Geodiversity; Geotourism; Sustainable Tourism; Tourist Experiences; Tourism Promotion*

### Introduction

#### **Background and Context**

The tourism industry has become one of the most dynamic and rigorously developing and expanding industries in the world economy. According to UNWTO (2019), tourism is a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes, which depicts that tourism is a tool for fostering cultural exchange, economic growth, and environmental awareness. As shown in the statistical report of the Sri

Lanka Tourism Development Authority, in 2023, Sri Lanka recorded a total of 1,487,303 international tourist arrivals to the country, which has enabled it to generate USD 2.07 billion in foreign exchange earnings. Also, this has contributed to 2.5% of the country's GDP, highlighting the importance of the tourism industry to Sri Lanka's economic development and recovery from the present economic crisis situation of the country (Sri Lanka Tourism Development Authority, 2023; Dissanayake & Samarathunga, 2021).

Identified as the "Pearl of the Indian Ocean," Sri Lanka is renowned for its rich biodiversity and strategic geographical location, which has attracted merchants, explorers, and travellers for centuries. The country offers a diverse range of tourism experiences, including pristine beaches, ancient ruins from various historical kingdoms, cultural diversity, and unique geological formations (Fernando, Bandara & Smith, 2016). While traditional tourism activities dominate, the potential of niche tourism products, such as geotourism, remains underexplored (Sumanapala, Kubalíková & Wolf, 2021). Geotourism, driven by Sri Lanka's vast geodiversity, presents significant opportunities for the sustainable development of the tourism industry.

Explained by Grey (2013), geodiversity, if defined as the natural diversity of geological structures, landforms, minerals, and physical processes, is playing a special role in shaping biodiversity, cultural landscapes, and natural heritage. However, according to Katupotha and Sumananarathna (2020), the potential of geotourism as a pull motivation factor in the tourism sector of Sri Lanka has not been fully explored. This study investigates the role of geodiversity in influencing tourist decision-making, aiming to position Sri Lanka as a preferred geodiversity destination.

### ***Geodiversity in Sri Lanka***

Sri Lanka is recognised for its unique geodiversity, which serves as the foundation for its rich biodiversity and cultural heritage. According to Ramakrishnan (2012), the island's geological structure is primarily composed of Precambrian rocks, which make up approximately 90% of its foundation. These rocks are organised into four major lithotectonic units: the Highland Complex, Vijayan Complex, Wannu Complex, and Kadugannawa Complex. These formations date back approximately 2,000 million years.

Iconic sites such as Sigiriya, Horton Plains, Dambulla caves, and petroglyphic locations like Dorawakakanda and Hulannuge showcase Sri Lanka's geological and archaeological importance. As shown by Sumanapala, Kubalíková & Wolf (2021), these sites not only signify the rich geodiversity of Sri Lanka but also provide avenues for educational and experiential tourism.

Studied by Sumanapala, Kubalíková & Wolf (2021), in addition to geological features in the country, climatic diversity of Sri Lanka further enhances its tourism potential. Declared a UNESCO heritage site, the Central Highlands are characterised by the lush greenery, northern regions exhibiting the arid landscapes, and a mosaic of ecosystems and cultural influences. This diversity has become a major influencer in shaping Sri Lanka's history, making it a hub for trade, agriculture, and a settlement for over centuries.

### ***Research Problem***

As shown by Ólafsdóttir & Tverijonaite (2018), geotourism, which is a niche tourism segment, is centred on the appreciation of geological features and landscapes, which offers a promising road for sustainable development. According to Newsome & Dowling (2006), Hose (2012), and Ólafsdóttir & Tverijonaite (2018), geotourism has gained worldwide concern, with countries recognising the benefits of geotourism in protecting the geological heritage and leveraging it to attract a discerning class of tourists interested in nature science and sustainable practices. This trend holds the potential to convert the tourism landscape of Sri Lanka, enabling sustainable development and a fostered future.

Showed by Sumanapala, Kubalíková & Wolf (2021), even though there is a lack of formally declared geopraks in Sri Lanka, the island's geodiversity holds a great potential for their establishment, contributing to a diverse tourism experience. Developing geotourism in Sri Lanka faces several challenges, such as a lack of comprehensive geological surveys and documentation, infrastructure requirements and a

balance with the conservation efforts (Katupotha & Sumanarathna, 2020; Sumanapala, Kubalíková & Wolf, 2021).

Despite Sri Lanka's rich geodiversity, it holds a huge potential in promoting the tourism industry as a hotspot of geotourism, and its potential as a significant pull factor in tourism remains underexplored. Even though the geodiversity of the country holds a variety of geological environments, phenomena, and processes that shape landscapes and provide resources, its integration into tourism strategies has been limited. This situation can be seen as it is evident in the scarcity of research focusing on geodiversity's role in attracting tourists to Sri Lanka.

The lack of comprehensive geodiversity action plans further limits the promotion of geotourism. According to Kubalíková *et al.* (2024), comprehensive geodiversity action plans are instrumental in developing sustainable tourism and environmental education. The absence of these kinds of plans indicates an omitted opportunity in integrating geodiversity into tourism development frameworks.

In addition, existing studies on tourist motivations in Sri Lanka have not much addressed the influence of geological attractions. According to the study conducted by Prayag & Ryan (2011), understanding these motivations is very important for developing targeted marketing strategies and enhancing tourists' experiences. The current research gap limits the ability to leverage the geodiversity as a unique selling proposition in the competitive tourism market.

Finally, addressing this gap is essential for diversifying the Sri Lankan tourism offerings and promoting sustainable tourism practices. By combining geodiversity into tourism strategies, Sri Lanka can attract a wide spectrum of tourists, including those with specific interest in geology and natural landscapes. As of Newsome & Dowling (2006) and Newsome & Dowling (2018), this study will align with the global trends focusing on sustainable and niche tourism markets.

### **Research Objectives**

*According to the identified research gap, the following research objectives were addressed by this research study:*

1. To identify geodiversity as a pull motivation factor for selecting Sri Lanka as a preferred holiday destination
2. To understand tourists' perceptions of Sri Lanka's geodiversity.
3. To identify the types of tourist activities and experiences associated with geodiversity in Sri Lanka
4. To provide insights and recommendations for developing Sri Lanka as a geodiversity destination.

### **Literature Review**

Geodiversity is defined as the variety of geological features, landscapes, and processes within a given area that has become a popular component of tourism worldwide (Grey, 2013). Besides its intrinsic value for conservation, geodiversity offers unique and authentic experiences for travellers, enriching the tourism offerings of a destination (Farsani, Coelho & Costa, 2011). As said by Katupotha and Sumanarathna (2020), countries like Sri Lanka, where diverse geological features such as mountains, coastal plains, and ancient rock formations form part of the country's natural and cultural identity, provide unique and authentic experiences for the travellers. The importance of geodiversity as a pull motivation for tourists acts as a connector of visitors with the earth's history and natural processes (Newsome & Dowling, 2006). Through a comprehensive literature review, this research explores the concept of geodiversity and its implications for tourism, theoretical perspectives on tourist motivations, global examples of geodiversity as a tourism offering, and its application to the Sri Lankan context.

### **Importance of Geodiversity in Tourism**

As explained by Grey (2013), geodiversity is the abiotic equivalent of biodiversity, including geological formations, landforms, minerals and the physical processes that shape them. The role of geodiversity in tourism is diverse as it offers aesthetic, recreational, cultural, and educational values (Newsome & Dowling, 2006; Newsome & Dowling, 2018). On the other hand, the cultural importance of geodiversity, especially the role in local traditions and crafts, increases its tourism appeal (Kubalíková *et al.*, 2024).

In Sri Lanka, iconic sites like Sigiriya, Pidurangala, and Horton Plains demonstrate how geodiversity can act as a pull factor, attracting tourists interested in geological exploration and natural beauty (Sumanapala, Kubalíková & Wolf, 2021; Jayasingha & Raveendrasinghe, 2024). In addition, Farsani, Coelho & Costa (2011) showed that promoting geodiversity-based tourism aligns with sustainable tourism principles, aiding in environmental conservation and socio-cultural well-being.

According to various scholars, the rich geodiversity of Sri Lanka, including its cultural and natural heritage, offers enormous potential for developing geotourism as a sustainable tourism segment. The country's geomorphology and geoheritage sites provide unique attractions that cater to tourists interested in geology, ecology and culture. According to the studies, Sri Lanka is predominantly composed of Precambrian high-grade metamorphic silicate rocks, totalling approximately 90% of the land area, with the remaining Miocene limestone and Jurassic sediments (Cooray, 1994; Cooray, 1984; Cooray, 1984). This diverse geological composition offers a greater foundation for geotourism development. Identical geological formations, including Horton Plains, Sigiriya, and the cave systems of Batadombalena, showcase the interconnection between the natural processes and human history (Chandrajith, 2020). These sites showcase the geological history of the earth and serve as centres for cultural narratives and tourism (Jayasingha, Abeynayake & Baduraliya, 2023).

Sri Lanka's topography, characterised by its highlands, plateaus, and coastal plains, creates a variety of landscapes attractive to tourists. As an example, Horton Plains plateau offers opportunities for nature walks and ecological studies, while the Beragala-Haputale region provides stunning vistas (Katupotha & Sumananarathna, 2020). As shown by Chandrajith (2020), interactions between geological and hydrological processes are seen in places such as Bambarakanda Falls, the tallest waterfall in Sri Lanka, and the river valleys, which begin from the central highlands.

Sri Lankan geoheritage is hardly connected with the culture and the history. Sites such as Adam's Peak and Sigiriya integrate geological features with religious and historical events, enhancing their attraction to both national and international tourists. These attractions reflect the connection between geodiversity and heritage, remarking the multidimensional products of geotourism (Roberts, 2021).

### **Theoretical Perspectives on Tourist Motivation**

For an effective promotion of geodiversity-based tourism, it is very important to understand the theories of tourist motivation. According to the push and pull framework identified by Dann (1977) and Fodness (1994), distinguish internal motivations (push factors) and external destination attributes (pull factors). Push factors include the desire for relaxation, adventure, and learning. For geotourism, fascination with geological wonders or a desire to escape routine can be considered as push factors. In addition, attributes of the destination, such as the unique landscapes of the Central Highlands or ancient rock formations at Sigiriya in Sri Lanka, can be considered as pull factors (Crompton, 1979; Baloglu & McCleary, 1999)

As shown by Talebi *et al.* (2023), Maslow's hierarchy of needs provides a framework for understanding how tourism fulfils higher-order needs such as self-actualisation and aesthetic appreciation. Iso-Ahola's need satisfaction theory also highlights the alignment between tourist motivations and the experiences offered by the destination with diversities, such as geodiversity (Iso-Ahola, 1982).

### **Geodiversity as a Tourist Attraction in Different Destinations**

Global best examples for successful promotion of geodiversity as a tourism attraction can be seen in European destinations like the Czech Republic. They have initiatives like geotourism trails and interpretive centres, which highlight the cultural and natural value of geological features (Kubalíková *et al.*, 2024). (Falcão, Damásio & Melo, 2015) show that geocaching activities in Portugal attract tourists interested in discovering hidden geological treasures. Yi-fong (2012) studied that geodiversity often connects with adventure tourism activities such as rock climbing and geological hikes. They studied how Taiwan's Taroko National Park exemplified how unique geological landscapes can attract adventure-seeking tourists. Another study conducted by Robina-Ramirez *et al.* (2023) studied how the Azores in Portugal use their volcanic landscapes and hot springs to create a distinctive destination image, demonstrating how geodiversity contributes to the appeal of a destination. As studied by Kubalíková *et al.* (2024),

geodiversity not only provides recreational and educational opportunities but also offers cultural ecosystem services. Geological formations often hold spiritual and cultural significance for local communities, offering tourists unique cultural immersion experiences.

In Sri Lanka, geodiversity intersects with cultural heritage in various ways, such as the use of geological materials in traditional crafts and the spiritual significance of rock formations like Mihintale. These cultural associations enhance the emotional and cognitive values of the tourism experiences.

### **Methodology**

To explore geodiversity as a pull motivation for tourists visiting Sri Lanka, this study utilised qualitative methodology. The qualitative approach aligns with the study objectives of gaining in-depth insights into tourists' perceptions and experiences. Using in-depth interviews, this research gathered rich data that revealed the role of geodiversity on tourists' destination choices. This section of the paper discusses the research approach, methods, sample selection, data collection process, data analysis techniques and ethical considerations.

### **Research Approach**

As it is ideal for exploring complex phenomena through the subjective perspectives of participants, this study adopted a qualitative research approach. According to Creswell & Poth (2016), qualitative research focuses on the collection of rich, non-numerical data in natural settings, allowing for an in-depth understanding of people's experiences and perceptions. As it enables investigating the diverse ways in which geodiversity influences tourists' decision-making, the researchers have used a qualitative approach for this study. Scholars have identified that qualitative research prioritises contextualised understanding, providing flexibility to explore participants' narratives and uncover the underlying motivations (Denzin & Lincoln, 2011). This chosen methodology parallels the aim of this study to dive into the multidimensional aspects of geodiversity and its role as a pull motivation.

In-depth interviews were used as the primary research method for this study. As explained by Rubin & Rubin (2011), in-depth interviews enable the researchers to conduct a detailed exploration of participants' experiences and viewpoints. Further, semi-structured interviews were used to provide consistency while allowing flexibility to probe into emerging themes. For this study, an interview guide was developed while ensuring its alignment with the research objectives. This created guide included open-ended questions that addressed tourists' motivations, awareness of geodiversity, experiences with geodiversity sites in Sri Lanka, and recommendations for promoting geodiversity tourism. Aligning with the findings of Seidman (2006), the interview guide created for this study was piloted with a small group of participants, resulting in minor adjustments to improve the relevance and comprehensibility.

### **Sample and Sampling Techniques**

This study employed purposive sampling to select participants with relevant experiences of geodiversity in Sri Lanka. Palinkas *et al.* (2015) explained that, using this method, it ensured that participants possessed firsthand knowledge of the research topic, making them well-suited to provide rich and meaningful data. A total of twenty participants were selected using this technique for this study, the tourists who had visited geodiversity sites in Sri Lanka, such as Sigiriya, Horton Plains, Dambulla cave complex, Pidurangala, etc. In addition to purposive sampling, the study used snowball sampling to identify additional participants through referrals. Shown by Guest, Bunce & Johnson (2006), this approach leveraged the networks of initial participants, facilitating the selection of individuals who met the inclusion criteria and had unique insights into geodiversity tourism

### **Data Collection and Analysis**

Data were collected through semi-structured, one-on-one interviews conducted physically and in online mode. Each interview lasted 60 to 90 minutes, allowing participants ample time to share their experiences and insights. Open-ended questions encouraged participants to discuss their perceptions of geodiversity, the factors influencing their destination preferences, and the types of activities they associated with geodiversity in Sri Lanka. Before each interview, participants were briefed about the study's objectives

and procedures, and informed consent was obtained. With participants' permission, interviews were audio-recorded to ensure accurate transcription and analysis. Field notes were also taken during the interviews to capture non-verbal cues and contextual details.

To analyse the collected data, thematic analysis was used by the researchers. As explained by Braun & Clarke (2019), this iterative approach involves identifying, analysing, and interpreting patterns within qualitative data. The analysis began with familiarisation, during which the researcher repeatedly reviewed interview transcripts to gain an in-depth understanding of the data. The next step was generating codes highlighting meaningful data segments related to the research objectives. These codes were then organised into potential themes, reflecting the relationships and connections between them. Themes were refined through iterative discussions and reviewed to ensure consistency and accuracy. To enhance the reliability of the analysis, intercoder reliability was established by having a second researcher independently code a subset of the data. Differences were discussed and resolved, ensuring a consensus on the final themes. Participants were incorporated to illustrate and support the identified themes.

### **Ethical considerations**

Informed consent was secured from all participants, who were briefed about the study's purpose, procedures, and their rights, including the ability to withdraw at any time. Anonymity and confidentiality were maintained by assigning pseudonyms to participants and securely storing all data. Audio recordings and transcripts were used solely for research purposes and were securely stored until they were permanently disposed of after the study was completed.

### **Results and Discussion**

The thematic analysis showed patterns and insights that fit with the study's goals, offering an in-depth understanding of the role of geodiversity as a pull motivation factor in Sri Lankan tourism. Findings of the study are categorised into themes and sub-themes that correspond to each research objective, supported by codes and direct quotes from participants. Data findings of the research were structured to address each objective systematically, starting with the identification of geodiversity as a pull motivation, followed by an exploration of tourists' perceptions, activities and experiences associated with geodiversity. Finally, insights and recommendations for developing Sri Lanka as a premier geodiversity tourism destination are discussed. Comparisons with global geotourism trends and theoretical frameworks provide a comprehensive understanding of the data. By combining empirical evidence with existing knowledge, this research study offers actionable insights for both academic and practical applications in the field of geotourism.

#### ***Objective 1: Identify Geodiversity as A Pull Motivation for Selecting Sri Lanka as A Preferred Holiday Destination***

Data analysis revealed that geodiversity serves as a significant pull motivation for tourists selecting Sri Lanka as their holiday destination. This finding is supported by two sub-themes: geodiversity as a motivational factor and the unique geological features of Sri Lanka. These themes highlight the intrinsic and extrinsic value of geodiversity, with geological formations and natural beauty playing primary roles in influencing tourist decisions.

#### ***Role of Geodiversity in Destination Selection***

##### ***Geodiversity as a Motivational Factor***

Participants frequently cited Sri Lanka's geological features, natural beauty and cultural significance as a key motivation for their visit. The island's diverse landscapes, ranging from ancient rock formations to pristine coastal areas, provide a rich tapestry of experiences for geotourism. One participant stated, "*Sri Lankan geological formations are unlike anything I've seen before,*" highlighting the uniqueness of these natural assets.

This finding aligns with Grey's (2013) findings that geodiversity contributes significantly to tourism by offering aesthetic and educational value. Geological landmarks such as Sigiriya and Adam's Peak, which combine natural wonder with cultural narratives, exemplify the appeal of geodiversity as a motivational

factor. Similarly, Newsome & Dowling (2018) highlight the intrinsic value of such features in attracting visitors seeking authentic experiences.

Geodiversity in Sri Lanka also fulfils the growing demand for sustainable tourism experiences. Tourists tend to prioritise destinations where natural beauty is preserved and cultural significance is celebrated. These attributes position the geodiversity of Sri Lanka as a central component of Sri Lankan tourism offerings, meeting the expectations of the environmentally conscious travellers.

### **Unique Geological Features**

The compact geodiversity of Sri Lanka is a highlighting factor, enabling tourists to experience a wide range of geological formations and landscapes with a relatively small geographic area. A participant highlighted, *“Within a few hours, we went from mountains to beaches,”* highlighting the country’s accessibility and diversity. This compactness enhances the tourist experience, allowing for multi-faceted itineraries that combine adventure, relaxation, and education.

Comparable to destinations like Iceland, where compact geodiversity attracts visitors from around the world (Kubalíková *et al.*, 2024), the ability of Sri Lanka to showcase its geological diversity within a short travel radius is a unique advantage. Iconic sites such as Sigiriya and Horton Plains serve as main attractions, drawing tourists seeking to explore both natural and cultural heritage. Sigiriya, with its ancient rock fortress and surrounding landscape, exemplifies the intersection of geology and history, creating a unique geotourism product.

The role of these iconic sites extends beyond the aesthetic appeal. They contribute to shaping Sri Lankan identity as a geotourism destination, leveraging their global recognition to attract international travellers. (Katupotha & Sumananarathna, 2020) highlight the importance of preserving and promoting these features as part of a broader geotourism strategy, ensuring their continued contribution to the tourism sector.

The findings under the first research objective of this study confirmed the critical role of geodiversity in attracting tourists to Sri Lanka. Geological features and natural beauty emerged as dominant motivational factors, aligning with existing literature on the importance of geodiversity in tourism. (Grey, 2013) and (Newsome & Dowling, 2018) emphasise that destinations rich in geodiversity not only provide aesthetic value but also create opportunities for learning and cultural engagement.

The compact geodiversity of Sri Lanka, which allows tourists to experience diverse landscapes within a short travel distance, positions the country in a competitive geotourism market. This feature mirrors global geotourism trends in destinations like Iceland, where accessibility and diversity are leveraged to enhance visitor experiences (Kubalíková *et al.*, 2024). Sites such as Sigiriya and Horton Plains further enhance the Sri Lankan appeal, mixing geological wonder with historical and cultural significance to offer a holistic tourism experience.

By capitalising on the geodiversity and integration with tourism strategies, Sri Lanka can attract a more diverse visitor base while promoting sustainable practices and preserving its natural heritage.

### **Objective 2: Understand the Perception of Tourists Towards Geodiversity of Sri Lanka**

Under this objective, the researchers explored how tourists perceive Sri Lankan geodiversity, focusing their awareness and emotional engagement. The analysis revealed two primary sub-themes: awareness and knowledge, and impressions and interpretations. These themes highlight the need for improved education and marketing strategies to enhance tourists’ understanding of Sri Lankan geological richness while highlighting the strong emotional responses elicited by these natural features.

#### **Tourist Perceptions of Geodiversity**

##### *Awareness and Knowledge*

Awareness of Sri Lankan geodiversity varied among participants, with some reporting a lack of prior knowledge about the geological richness of the country. Many tourists discovered the extent of Sri Lankan diverse landscapes only after their visit; as an example, one participant revealed, *“Before planning this trip, I didn’t realise the extent of Sri Lankan geological diversity.”* This highlights a

significant gap in pre-visit awareness, which could be addressed through more targeted educational and promotional initiatives.

This finding parallels the findings of Newsome's (2010) work, which shows the importance of geotourism education in fostering a deeper appreciation for geological heritage. Informing the potential visitors about the geological assets of Sri Lanka through digital platforms, interpretive guides and travel literature could fill this gap and attract a more informed audience. As an example, promoting lesser-known geological features along the iconic sites, such as Sigiriya and Horton Plains, may encourage longer stays and repeat visits.

The lack of awareness also shows the importance of an opportunity for integrating geological education into the tourism experience. Participants expressed interest in learning more about the history and formation of the sites they visited, suggesting that educational tours and interpretive centres could enhance their satisfaction. This finding aligns with global tourism trends, where experiential learning plays a central role in enriching the visitor experience (Farsani, Coelho & Costa, 2011).

### *Impressions and Interpretations*

Tourists frequently describe encountering Sri Lanka's geodiversity as awe-inspiring, emphasizing the emotional impact of these experiences. One participant shared, "*The cliffs at World's End left me speechless,*" capturing the profound sense of wonder evoked by the island's natural landscapes. These reactions reflect the aesthetic and emotional value of geodiversity, which Grey (2013) identifies as a key component of its appeal to visitors.

Beyond awe, participants also highlighted the cultural and historical significance of Sri Lanka's geological features. The integration of cultural narratives with geological landmarks—such as the Sacred Adam's Peak and the Sigiriya Rock Fortress—added depth to their experiences. As one participant expressed, "*The geology of the site, combined with its cultural meaning, made it unforgettable.*" This finding underscores the intersection of geodiversity and cultural heritage, showcasing the unique value Sri Lanka offers to its visitors.

The emotional responses and cultural connections identified in this study align with global geotourism examples, such as the Azores' volcanic landscapes, where the interplay between natural beauty and cultural identity creates a compelling tourist experience (Robina-Ramirez *et al.*, 2023). By highlighting these intersections, Sri Lanka can enhance the storytelling component of its geotourism offerings, fostering stronger emotional connections with visitors and promoting a deeper appreciation of its geological heritage.

The findings demonstrate that while tourists have strong emotional reactions to the geodiversity of Sri Lanka, there is a clear need for improved awareness and educational outreach. Newsome & Dowling (2018) highlight that geotourism becomes popular when visitors are both informed and emotionally engaged. Addressing gaps in awareness through targeted campaigns, interpretive materials, and experiential learning opportunities can develop the position of the country as a leading geotourism destination.

Furthermore, the emotional connections reported by participants highlighted the intrinsic and extrinsic value of geodiversity. Awe and wonder serve as powerful motivators for tourism, while the integration of cultural narratives with geological features offers a multidimensional experience. By leveraging these emotional and cultural connections, Sri Lanka can differentiate itself in the competitive geotourism market and create memorable experiences that encourage repeat visits.

### ***Objective 3: Identify the Types of Tourist Activities and Experiences Associated with Geodiversity in Sri Lanka***

Tourists who are visiting Sri Lanka engage in a diverse range of activities that are leveraging the country's geodiversity. These activities, such as spanning exploration, adventure and cultural experiences, highlight the multifaceted appeal of geological features of the country. By the third objective of this study, it explores



these activities through three sub-themes, which are exploration of geological sites, adventure activities, and cultural and historical encounters.

### **Geodiversity-Enhanced Tourist Activities**

#### *Exploration of Geological Sites*

During the study, it was identified that exploring geological landmarks has emerged as a popular activity among tourists. Participants frequently mentioned hiking and photography as key elements of their experiences. Iconic geological sites such as Adam's Peak, Horton Plains, and Sigiriya were highlighted as must-visit destinations for geotourists. One participant mentioned, "*The hike to Adam's Peak was an adventure of a lifetime,*" reflecting the physical and emotional impact of exploring these landscapes.

Geotourists are attracted to these sites for their natural beauty, historical significance, and the sense of accomplishment associated with physical exploration. The popularity of geodiversity sites in Sri Lanka is similar to the appeal of global geological attractions like the Grand Canyon, which (Grey, 2013) describes as symbolic destinations for geological exploration and education. This finding highlights the potential of Sri Lanka to position itself as a premier geotourism destination through the promotion of its geological landmarks.

Another key motivation for visiting geological sites is photographic opportunities. Many participants shared that dramatic landscapes and unique formations provide a rich canvas for capturing memorable moments. The visual appeal of Sri Lankan geodiversity not only enhances tourist experiences but also supports destination marketing through social media and digital storytelling.

#### *Adventure Activities*

The geodiversity of Sri Lanka supports a variety of adventure tourism activities, ranging from rock climbing to eco-tourism activities. Participants described these experiences as thrilling and immersive, with one sharing, "*Climbing in Ella combined thrill and geology.*" The combination of adrenaline-pumping activities and geological exploration offers a unique draw for adventure seekers.

The synergy between adventure tourism and geodiversity aligns with trends in sustainable tourism, as highlighted by Veras, Barros & Dinis (2024). For instance, destinations like Taroko National Park of Taiwan integrate adventure sports with the appreciation of geological features, creating a sustainable model for engaging visitors. Similarly, in Sri Lanka, rugged landscapes, including the hills of Ella and the boulders of Sigiriya, provide ideal settings for combining adventure and education.

Also, during the data analysis process, it was identified that ecotourism activities such as guided treks and wildlife tours in geologically significant areas emerged as a popular choice among participants. These activities not only enhance the tourist experience but also promote conservation and community involvement, reinforcing the principles of sustainable geotourism.

#### *Cultural and Historical Encounters*

The integration of geological features with cultural and historical narratives was another significant theme. Participants frequently highlighted the value of exploring sites where geology and history intersect. One participant highlighted, "*Polonnaruwa connects history and geology beautifully,*" highlighting the seamless blend of cultural exploration and geological appreciation.

In sites like Sigiriya, Polonnaruwa, and Dambulla, the geodiversity of Sri Lanka is deeply intertwined with its cultural heritage. These locations offer visitors the opportunity to engage with both natural and man-made marvels, enriching their overall experience. The geological formations often serve as a backdrop for historical and cultural storytelling, creating a multidimensional tourism product.

This integration of geology and culture reflects global examples, such as the use of volcanic landscapes in Hawaii to narrate indigenous histories. As Katupotha & Sumananarathna (2020) suggest, the ability of Sri Lanka to connect geological and cultural narratives can serve as a key differentiator in the competitive tourism market. By emphasizing these connections, Sri Lanka can offer tourists an authentic and holistic experience that appeals to both adventure seekers and cultural enthusiasts.

The findings for objective one of this study revealed the diverse range of activities and experiences that tourists associate with the geodiversity of Sri Lanka. Exploration, adventure, and cultural engagement emerged as central themes, highlighting the multidimensional appeal of the geological features of the country. The activities parallel with global geotourism trends, where geological landmarks serve as focal points for education, recreation, and cultural exploration (Grey, 2013).

Adventure tourism, in particular, was identified as a significant draw for geotourists, offering opportunities for physical challenge and adrenaline-pumping experiences. The connection between adventure and geodiversity reinforces the importance of sustainable tourism practices, as noted by Veras, Barros & Dinis (2024). Eco-tourism activities further enhance this connection by promoting conservation and fostering community involvement.

The integration of geological features with cultural and historical narratives adds another layer of depth to the tourist experiences. This finding highlights the value of the geodiversity of Sri Lanka as more than just a natural attraction. It is a repository of cultural heritage and storytelling. By leveraging these intersections, Sri Lanka can differentiate itself in the global tourism market and create unique, memorable experiences for its visitors.

#### **Objective 4: Provide Insights and Recommendations for Developing Sri Lanka as A Geodiversity Destination**

Under the fourth objective, this study provides insights and actionable recommendations for positioning Sri Lanka as a leading geodiversity destination. Based on the findings, for sub-themes were revealed: visual storytelling, sustainable tourism practices, guided tours and educational experiences, and collaborative partnerships. These sub-themes highlight strategic avenues for enhancing the geotourism experience while ensuring long-term sustainability and stakeholder engagement.

#### **Promoting Sri Lanka as a Geodiversity Destination**

##### *Visual Storytelling*

The role of visual marketing and social media in promoting the geodiversity of Sri Lanka was frequently emphasised by the participants. Digital platforms emerged as powerful tools for inspiring travel decisions, with one participant sharing, “*Social media posts of World’s End convinced me to visit.*” This finding highlighted the potential of visual storytelling in amplifying the appeal of geodiversity sites.

Globally, destinations have effectively leveraged social media to showcase their geological wonders. (Falcão, Damásio & Melo, 2015) highlight the transformative power of visual marketing in geotourism, noting that captivating images and videos can trigger emotional connections and inspire curiosity. For Sri Lanka, this means investing in high-quality digital campaigns that showcase the uniqueness of sites like Sigiriya, Horton Plains, and Adam’s Peak. Platforms such as Instagram and YouTube can serve as virtual windows into the geodiversity of Sri Lanka, reaching a global audience and attracting geotourists with diverse interests.

##### *Sustainable Tourism Practices*

During the interviews, participants frequently emphasised the importance of sustainability in developing geodiversity tourism. One participant shared that, “*Preserving these sites is a collective responsibility,*” reflecting the growing awareness among tourists of the importance of conservation and ethical practices. Sustainability is a critical factor for the long-term success of geotourism. (Newsome & Dowling, 2006) argue that geotourism must balance visitor experiences with conservation goals to ensure the protection of geological features for future generations. For Sri Lanka, this means adopting measures such as visitor capacity management, habitat restoration, and waste reduction at popular sites. Additionally, integrating ecotourism principles into geotourism activities can foster a sense of environmental stewardship among both tourists and local communities.

Tourism operators and government authorities of Sri Lanka must prioritise environmental impact assessments when developing new geotourism initiatives. These assessments can help identify potential risks to geological sites and ensure that tourism activities align with conservation objectives.

##### *Guided Tours and Educational Experiences*

Guided tours and interpretive storytelling were highlighted as key elements of an enriching geotourism experience. One participant noted, "*Guided storytelling brought Sigiriya to life,*" emphasizing the value of narratives that connect visitors with the cultural and geological significance of a site.

As they enhance understanding and appreciation of geological features, educational experiences are central to the geotourism framework. (Braun & Clarke, 2019) argue that interpretive storytelling not only provides context but also fosters emotional connections between visitors and the destinations they explore. Sri Lanka can leverage this by investing in professional training for guides and developing interpretive centres at major geodiversity sites.

For instance, centres equipped with interactive displays, virtual reality experiences, and detailed geological maps can offer visitors an immersive learning environment. These initiatives can position Sri Lanka as an educational hub for geotourism, attracting both casual visitors and academic groups interested in geological studies.

### *Collaborative Partnerships*

The importance of collaboration between various stakeholders was another recurring theme. Participants highlighted the need for partnerships between government agencies, NGOs, and local communities. One participant shared, "*NGOs and communities must collaborate for conservation,*" emphasizing the shared responsibility in preserving and promoting geodiversity.

Globally successful geotourism projects have shown the value of stakeholder collaboration. As an example, community-led conservation initiatives in the Azores have effectively preserved volcanic landscapes while providing economic benefits to local residents (Robina-Ramirez *et al.*, 2023). Taking examples from those, Sri Lanka can adopt a similar approach by involving local communities in managing and maintaining geodiversity sites.

Partnerships with NGOs can also facilitate capacity-building programs and raise awareness about the significance of geodiversity. Additionally, government policies that incentivise sustainable tourism development, such as tax benefits for eco-friendly businesses, can encourage private sector involvement in geotourism projects. Collaborative efforts ensure that geotourism developments align with environmental, economic, and social goals, creating a win-win scenario for all the stakeholders.

The insights gathered from the participants for this objective of the study highlighted the multifaceted strategies required to develop Sri Lanka as a premier geodiversity destination. Visual storytelling, when combined with sustainable practices and educational initiatives, can elevate the geotourism experience while preserving the integrity of geological sites. As highlighted by Newsome & Dowling (2018), sustainability and conservation are non-negotiable components of successful geotourism.

The findings also emphasise the importance of stakeholder collaboration, echoing global best practices where partnerships have led to effective geotourism management. By aligning its geotourism strategy with these principles, Sri Lanka can attract a diverse audience, foster community empowerment, and position itself as a global leader in sustainable geotourism.

### **Limitations**

This study is limited by its small sample size, which may affect the generalisability of its findings. While this study's qualitative data provides valuable insights into geotourism, it does not allow for a statistical generalisation to a larger population. Additionally, the study focused on the prominent geotourism sites in Sri Lanka, where it may not fully capture the diverse experiences across other regions or seasonal variations, limiting the scope of the study. These limitations suggest that future research should expand the sample size, and if it includes the quantitative data, it will provide a more comprehensive understanding of geotourism in Sri Lanka.

### **Conclusion**

In this study, the researchers explored the role of geodiversity as a pull motivation for tourism in Sri Lanka, analysed tourists' perceptions and activities associated with geodiversity, and provided strategies for

promoting Sri Lanka as a premier geodiversity destination. Geodiversity was found to play a primary role in shaping the tourism landscape, contributing to both destination appeal and visitor satisfaction. By aligning the findings with the research objectives, the researchers have synthesised the insights of the study and proposed actionable recommendations for sustainable geotourism development.

Acknowledging the limitations of this study, the researchers of this study recommend exploring the mentioned areas to expand the findings of this study. Investigating the perspectives of local communities, who are connected with geotourism initiatives, can provide valuable insights into their challenges, expectations, and roles. Similarly, understanding the contributions and collaborations of other stakeholders, such as NGOs, private operators, and government agencies, can identify strategies for effective geotourism management. Another significant avenue is examining the environmental and economic impacts of geotourism, focusing on how it contributes to job creation and regional development while ensuring ecological sustainability. Finally, conducting longitudinal studies to track the evolution of geotourism in Sri Lanka would offer valuable insights into emerging trends, stakeholder dynamics, and the long-term sustainability of geotourism initiatives. By addressing these areas, future research can significantly contribute to the sustainable development of geotourism in Sri Lanka.

### **Key findings of the study**

The analysis revealed several important findings parallel to the study's objectives

#### *Geodiversity as a Pull Motivation*

Geological features and natural beauty emerged as strong motivators for destination choice. Sites like Sigiriya and Horton Plains, with their cultural and geological significance, exemplify the integration of geodiversity and cultural heritage.

#### *Tourists' Perceptions of Geodiversity*

While many tourists reported strong emotional connections to geodiversity, awareness of Sri Lankan geological richness was limited prior to their visit. This gap highlights the need for targeted education and marketing strategies.

#### *Geodiversity Enhanced Activities*

Exploration, adventure tourism, and cultural experiences tied to geodiversity were key attractions. Activities like hiking at Adam's Peak and rock climbing in Ella were particularly popular.

#### *Promoting geodiversity*

Strategies such as visual storytelling, sustainability, educational experiences, and stakeholder collaboration were identified as essential for developing the geotourism potential of Sri Lanka.

### **Recommendation**

#### *Conservation and Management*

The sustainable management of geodiversity sites is crucial for preserving their ecological and cultural value. Implementing buffer zones, monitoring systems, and clear visitor guidelines can mitigate environmental impact. Dedicated authorities for site management should be established, focusing on long-term sustainability.

#### *Awareness and Education*

Raising awareness about the geodiversity of Sri Lanka among domestic and international audiences is essential. Educational programs, interpretive centres, and interactive learning tools can enhance the understanding and appreciation of geological heritage by the visitors. Awareness campaigns through digital platforms and partnerships with travel agencies can also bridge the pre-visit knowledge gap.

#### *Enhance tourism activities*

Collaboration with adventure tourism operators can expand eco-friendly activities, such as guided hikes, rock climbing, and eco-tourism tours. Promoting cultural narratives tied to geological sites can create a holistic experience, combining adventure with education and heritage appreciation.

#### *Marketing and Visual Storytelling*

High-quality digital content showcasing the unique geodiversity of Sri Lanka must be prioritised. Social media platforms like Instagram and YouTube can highlight the accessibility and diversity of sites like Horton Plains and Adam's Peak, reaching a global audience.

#### *Stakeholder Collaboration*

Engaging local communities, NGOs, and private tourism operators is essential for fostering sustainable practices and ensuring the shared benefits of geotourism. Incentivising community-driven conservation efforts and creating revenue-sharing models can enhance both site preservation and community livelihoods.

### **Implications**

Geotourism can contribute significantly to job creation, income generation, and regional economic development. Investments in geodiversity tourism are likely to have multiplier effects, benefiting the adjacent industries. By integrating geological and cultural storytelling, geotourism supports the preservation of the rich cultural heritage of Sri Lanka. Conservation strategies for geodiversity align with global environmental goals, ensuring the long-term sustainability of geological sites. Geotourism offers a unique opportunity for the diversification of tourism offerings in Sri Lanka, expanding beyond traditional attractions and catering to niche markets like adventure and eco-tourism.

### **Conflict of Interest**

The authors declare that they have no conflict of interests.

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