

Exploring the Potential Assessment of Geo-heritage Sites in Hyderabad: A Case Study



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ABSTRACT: Geo-sites are places in nature that are more obviously noticeable. Sites classified as geoheritage are those that are more vulnerable to the history of a particular region or place. Geo-heritage sites combine geological, historical, cultural, and educational elements. To ensure that a region or culture survives, these important sites need to be recognized and preserved for next generations. Telangana has been controlled by several dynasties, and the region is home to several geo-heritage monuments, including Golkonda Fort and others in and around Hyderabad, which are encircled by ancient and geological structures. Each of these cultural sites, which are dispersed around Hyderabad, has a unique historical value. Finding geo-heritage locations and assessing their historical significance is the primary objective of the paper. Having been abandoned, these locations are unable to enlighten tourists about the region's past. About the locations that exist in these places, there is no information or museum. These objectives guide the conduct of the investigation, and the present paper presents the proper metrics and findings.

KEY WORDS: Geo sites, Geo heritage, Golkonda fort, Future generation.

INTRODUCTION

The importance of geo-heritage sites—pristine areas, landscapes, and geological formations of considerable scientific, educational, cultural, and aesthetic significance— has gained increased attention in recent years. These sites enhance the cultural identities of regions globally and provide insights into the Earth's history and evolution, while also serving as essential habitats for diverse species. It is imperative to identify, protect, and preserve these invaluable geo-heritage sites as urbanization and development persist in transforming landscapes. Hyderabad, a city celebrated for its rapid urban development and rich cultural heritage, exemplifies the challenges of preserving geo-heritage amid modernity.

Hyderabad, located in the heart of southern India, features a diverse array of geological formations, ranging from ancient rock structures to unique landforms shaped by millennia of natural processes. However, the integrity of these geological treasures is jeopardized by expanding urban infrastructure and industrialization, highlighting the necessity for comprehensive conservation efforts. The study will analyse the identification and preservation of geo-heritage sites in Hyderabad, highlighting their unique geological features and significance, as well as the strategies employed for their protection. Examining the geological, ecological, and cultural significance of these locations enhances our understanding of their role in fostering scientific inquiry, sustainable tourism, and environmental stewardship. A variety of strategies, including regulatory frameworks, educational initiatives, geological surveys, and mapping projects, are being employed to tackle the challenges posed by urbanization and ensure the enduring preservation of Hyderabad's geo-heritage. The objective of this analysis is to emphasize the significance of geo-heritage protection in promoting community engagement, cultural preservation, and environmental sustainability. Stakeholders can formulate effective management plans that reconcile the imperative to conserve our geological heritage for future generations with developmental pressures by understanding the importance of these sites and the challenges they encounter. The Hyderabad case study highlights the difficulties of identifying and safeguarding geo-heritage sites amid urbanization. An examination of the dynamic interplay between geological conservation and human development may yield significant insights into the broader global effort to safeguard the natural and cultural heritage of our planet. More than six hundred years have elapsed since the construction of the Golconda fort. Prior to its designation as Makhil, the Golconda fort was merely a shepherd's hill. This location is positioned 120 meters above sea level and is constructed on a granite rock foundation. The Kakatiya dynasty constructed this site during their western expansion. The Golconda Fort was constructed by the Kakatiyas and governed by the Nizam sultans, the

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Brahmanis, and the Kakatiyas themselves. It held the preeminent advantage in commerce and governance at that time. It serves as the universal trademark for diamonds worldwide. All gemstones, such as the Wittelsbach-Graff diamond, Hope diamond, Regent diamond, Kohinoor, Noor-ul-Ain, and Daria-i-Noor, have been produced and mined in Golconda. UNESCO is an institution that endeavors to achieve long-term development goals. It is the premier monitoring entity for geo-heritage sites worldwide. The preservation and management of geoheritage sites in India rely solely on the geological characteristics of the locations, under the supervision of the Geological Survey of India (GSI). INTACH was established in 2019 to enhance public awareness of the region's culturally and geologically significant resources. A group from India submitted a provisional nomination for the Golconda Fort to UNESCO in 2010. The individuals truly dedicated to the environmental and cultural preservation of Hyderabad are remarkable. Organizations advocating for rock preservation in and around Hyderabad include the Geological Survey of India (GSI), the Society for the Preservation of Rocks, and the Society of Earth Sciences. In 1981, HUDA established the heritage conservation committee to evaluate a building's architectural and historical importance. The committee's principal responsibility is to compile a list of heritage structures and, contingent upon the condition of each property, to periodically seek authorization from the state government.

Concentrated on the natural evolution of landforms and their temporal changes, as specific landforms are interconnected with the natural environment, it is imperative to study and preserve them. The geomorphological maxim asserts that "the present serves as the key to the past." Consequently, comprehending the historical context of a specific region can prove challenging, even following extensive research, interpretation, and analysis of geo-sites or geo-heritage locations.

REVIEW OF LITERATURE

Geography and you (2019) it was published on Indian spectacular geo-heritage sites, he describes how the region's sustainable growth and community development are being enhanced by the geo-park network's balanced culture and integration of research, education, and tourism. Geoparks are the nation's natural heritage; they are proof of the earth as well as cultural and historical artefacts that demonstrate the natural and rich legacy of the nation. The Society of Earth Science (SES) is putting more effort and attention into geopark and geo-heritage site conservation.

Mazumdar M.K and B.Bayan (2019) in his title conserving Indian geo-heritage: the geopark approach, The Geological Survey of India (GSI) has designated 34 geo-sites in 13 states as national geological monuments. Strict geo-conservation laws, the Geological Locations, Features, and Object Preservation Act of 2011 and the National Geological Sites (Conservation, Protection, and Management) Act of 2013, increased public awareness of the need to protect geoheritage sites, and, eventually, an expanded draft of the 2019 bill prepared final policy by INSA, SES, and IUGS INQUA and necessary considerations. Geoparks are valuable assets that may be utilised to preserve our cultural legacy and foster the growth of nearby towns by creating tourist attractions.

Mukund Sharma(2019) in his paper stromatolites the building blocks of life, the evidence that will help to understand how the earth formed and developed is found in the strombolites. He gave an explanation of the cyanobacteria that cause stromolites to develop in water. Many GSI and other officials had recollections in such regions throughout the 18th and 19th centuries, but they did not view them as stromatolites. William King discovered unusual segregated and laminated limestones near Cuddaph in order to chart the diamonds. The key to eliminating stromatolites in

India, where they are under jeopardy, is excessive mining. Rajasthan's Jhamar Kotra Strambolites have been classified as national geoheritage monuments and as conservation sites.

Satish c tripathi (2019) in his paper he explained about one of the most destination sites in trans- Himalayan region. The country of high passes, Ladakh, is one of my favourite places to visit on holidays. It rose to fame in 2009 thanks to the Three Idiots movie. The Indian subcontinent's migration towards the Eurasian plate and the Indian plate's collision at Ladakh have been explained. It is an important location for Shyok Valley and Nubra.

D.Rajashekhhar reddy (2019) on his work coastal red sand it has explained about red sand in Vishakhapatnam. William King discovered it in 1886, and it covered an area of 10 square km. About 90 metres above mean sea level, it is the elevation. The GSI designated it as a national geoheritage asset in 2014. It's referred to as the Vishakhapatnam Dunes..

Subhash anand and Vidhi saluja(2019) the Varkala Cliffs in Kerala are significant due to its geological, geomorphological, and hydrological features. The organisations connected to geoheritage locations have been displayed. In addition, it is one of the geo-heritage sites close to Thiruvananthapuram with a thriving cultural site. Janardana Swamy temple, is known as the old Vishnu temple. Dakshina Kasi is another name for this Hindu pilgrimage shrine.

Punyakrit Singh Ranawat, Soni George (2019) in his paper titled Potential Geoheritage & Geotourism Sites in India, has stated that India is a growing nation with a wealth of natural resources, including geology, geomorphology, and national history. In terms of development sectors like the economy, it is comparable to other nations; nevertheless, in order to draw visitors from all over the nation, it should also compare the geological significance and the transformation of geo-heritage sites into geo-parks to

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international standards. It has provided an explanation of the fifteen prospective geo-heritage sites in India as well as other significant ecological areas, such as Kerala's Varkala Cliffs. In his conclusion, he clarified that, in comparison to other countries, the significance of geoparks and the upkeep of them by local and national agencies are lacking.

Punyakrit Singh Ranawat, Soni George (2020) titled Recognized Geoheritage & Geotourism Sites In India outlined the National Geological Monuments (NGM) that GSI has designated as locations. These locations are significant both scientifically and physically, and they have the potential to become global geoparks after being recognized by UNESCO. It may support tourism and our culture while preserving the local geology at those specific locations. The GSI has acknowledged twenty-six geo-sites. To put it critically, it should be understood that there are geological diversity places all around us. The government need to incentivize private entities to ensure the appropriate upkeep of these sites, as they hold economic significance.

Saurabh Mathur (2020) in his paper concept of Geoheritage: the words geo-tourism, geoconservation, history of geoheritage, and geoparks were reviewed in the context of India, along with a summary of previous researchers' findings on geoheritage locations. It is mentioned that despite these sites' abundance of geo-resources, a study was necessary in the Indian context.

NK Chuahan et.al (2022): The Indian state of Rajasthan has long been known for its variety in terms of its post-Christmas historical, industrial, and war-defense development, as well as its geology, geomorphology, flora, fauna, history, and ethnology. Situated in a small portion of Rajasthan, Udaipur and its environs are home to a wide variety of geological features, including Precambrian orogenic rocks, collision tectonics, ophiolite suites, carbonatites, massive deep-water sediments to shallow shelf carbonates. These features are astonishingly preserved in this small region and was divided the 27 geological heritage sites into four distinct routes. Almost all literature on structural geology and metamorphic and igneous petrology depict the micro, macro, and mega structures, which are traditionally exposed in the Udaipur region, which is one of the world's top geo-parks. Numerous well-known geologists in India and throughout the world have gained extensive knowledge from the region's geological exposures.

DATA BASE AND METHODOLOGY

Establishing a geo-heritage identification and preservation database necessitates meticulously compiling and integrating data from diverse sources across multiple disciplines. A comprehensive approach is necessary to ensure that all relevant factors affecting the identification and preservation of geo-heritage sites are considered. This includes field surveys, historical documents, geographic information system (GIS) data, geological surveys, and community input. By integrating multiple databases, researchers can create a comprehensive catalog of potential geo-heritage sites and assess their conservation status. The technique encompasses a systematic approach to the identification, assessment, and conservation of geo-heritage sites. The process encompasses literature reviews, stakeholder engagement, geological mapping, the establishment of site evaluation criteria, risk assessment, the formulation of conservation plans, policy recommendations, and outreach and educational initiatives. This interdisciplinary approach integrates scientific research, community involvement, and policy advocacy to achieve comprehensive geo-heritage protection. Geospatial information derived from GIS data is valuable for the management, analysis, and visualization of geo-heritage resources. By integrating GIS data layers, researchers can delineate geological characteristics, identify spatial patterns, and assess the relationships between geo-heritage sites and their adjacent landscapes, land uses, and environmental variables.

Government agencies have supplied secondary data regarding geo-sites and geo-heritage sites. GIS and Google Maps are utilized to identify, plot, and map the geographic locations of diverse sites. Both residents and tourists in the city and its surroundings remain oblivious to these concealed cultural landmarks. For them to visit any location, it must be managed by the tourism department and incorporated into their list of attractions.

ANALYSIS

Study Area: Hyderabad is shaped by the Deccan lava plateau, which features rocky lakes interspersed throughout the city and the usual rocky topography of the earliest lava. The rocky terrain surrounding Hyderabad, which was generated by lava from the Deccan trap, is characterised by undulating terrain with larger rock structures. These geological elements, such as rocks, are also included in the geo sites. These rocks will serve as the foundation for geological evidence in the future. Thanks to the Save Rock Society's assistance and real study, several of the rocks in the v-zone have been identified. The only places with a lot of rocky, mountainous terrain are the nearby Jubilee Hills locations. Geological proof of this kind may only be found close to the Jubilee Hills.

Hyderabad is one of India's cities that is expanding the quickest. Although the normal granitic rock formation is present, urban building operations are already breaking these rocks. Lakes, which are likewise generated by typical terrain with rock formations, need to be protected, but they are not being properly conserved.

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Table-1 List of the buildings in Hyderabad

Sl. No	Building	Location
1	AdilAlam Mansion, (Deleted from list	Nampally
2	Afzal Gunj Mosque	Afzal Gunj
3	Air & Land Warfare Building,	Secunderabad
4	Aiwan-e-Ali	Chowmahalla Palace
5	Aliabad Sarai	Falaknuma-Charminar main road
6	Allahuddins Building	Begumpet
7	Ameen Manzil	Saidabad
8	AmberpetBurj	Amberpet
9	State Central Library	Afzal Gunj
10	High Court of Judicature at Hyderabad	Hyderabad
11	State Archaeological Museum	Koti
12	Asmangarh Palace	Malakpet
13	Asman Mahal	Lakdi-ka-pool
14	AzhaKhana-e-Zehra	Darulshifa
15	Bai PirojbaiEduljiChennaiParsiDharamshala	Secunderabad
16	Baradari of NawabKhursheed Jah Bahadur	HussainiAlam
17	Baitul Ashraf	near Niloufer Hospital
18	BaquerBagh	Saidabad
19	Bhagawandas Garden Pavilion	Karwan
20	a) Charkaman; b) Machlikaman c) Kalikaman d) Sher-e-Batil-Ki-Kaman	Charminar
21	Chowmahalla Palace	Hyderabad
22	City College	Madina
23	Secunderabad Clock Tower	Secunderabad
24	Clock Tower	Sultan Bazar
25	Clock Tower & Ramgopalpet Police Station	James Street
26	Clock Tower	FatehMaidan
27	Clock Tower – Mahboob Chowk	Charminar
28	Dewan Devdi – Gate Portion	PatharGatti
29	Directorate of Industries	Chirag Ali Lane, Abids
30	ErrumManzil	Punjagutta
31	Falaknuma Palace	Falaknuma
32	Jama Masjid	Charminar
33	Jhamsingh Temple – Gate Portion	Mehdipatnam
34	Jubilee Hall	Nampally
35	King Koti Complex: a) Hospital (old) b) Usman Mansion c) NazriBagh	Hyderguda
36	British Residency Complex (Women’s College, Koti)	Koti
37	Nizamia Observatory	Panjagutta
38	Mahboob Chowk Mosque	Mahboob Chowk
39	Mahboob Mansion	Malakpet
40	Moghulpura Tombs	Moghalpura
41	MoazzamJahi Market	Mojam Jahi Market

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42	Nanu Bhai G. Shah's Building	Sultan Bazar
43	Nizam College	Basheerbagh
44	Osmania Arts College	Hyderabad
45	Osmania General Hospital	Afzal Gunj
46	Lady Hydari Club	Basheerbagh
47	Paigah Palace (Vikhar-ul-Umra Palace)	Begumpet
48	Parsi Fire Temple	Secunderabad
49	Puranapul bridge	PuranaPul
50	Purani Haveli Complex	PatharGatti
51	SitaramBagh Temple	Mangalghat
52	VikharManzil	Begumpet
53	Victoria Memorial Orphanage	Saroornagar
54	Government Unani Hospital	Charminar
55	Central Co-operative Training College	Nizam College Road
56	Mahboobia Girls High School & Junior College Madraasa-E-Aliya,	Gunfoundry
57	Nampally Sarai	Nampally

Source: <https://heritage.telangana.gov.in/monuments-in-telangana/hyderabad>

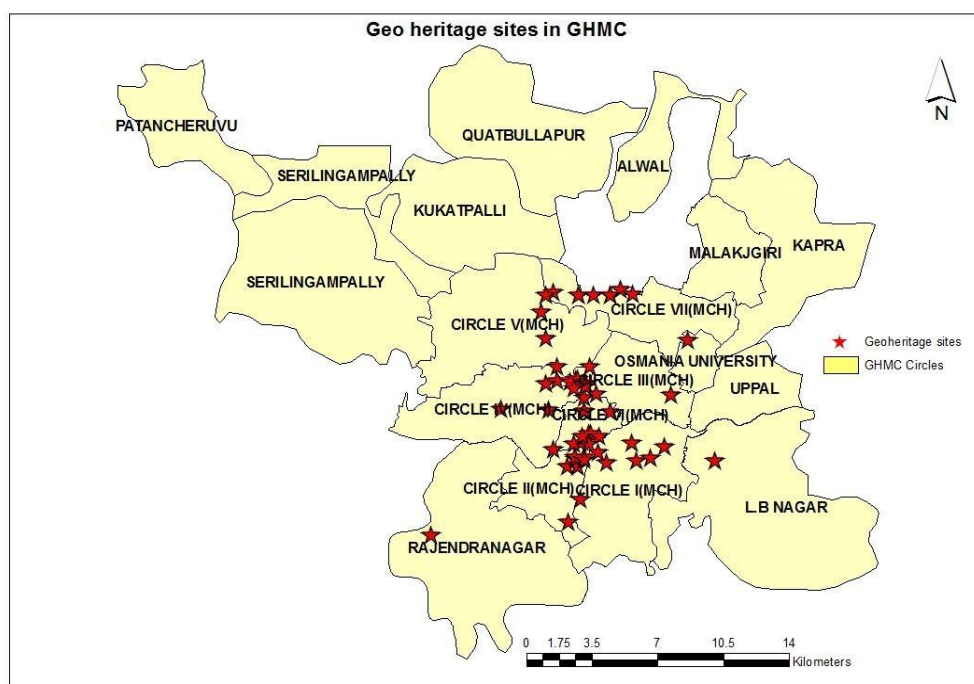


Figure-1 Geo heritage building sites in Hyderabad

Source: <https://heritage.telangana.gov.in/monuments-in-telangana/hyderabad>

These are a few historical buildings that illustrate Hyderabad's and Telangana's rich cultural past while also offering information about the area and people. It's important to investigate and oversee these building sites in the modern world. Private property owners own certain buildings, while the government manages others. The government is in charge of keeping an eye on all buildings, both public and private. The main site of the previous monarchs was on the banks of the Musi River, where the empires of the Hyderabad dynasty were founded. The locations are mostly inside the GHMC borders, both in terms of location and development. Only 56 of the 143 construction sites that are listed in the database can be located through a search or by looking at the sites' physical characteristics. Google Maps cannot be used to manually locate the remaining nameless locations. The I, II, IV, V, and VI circles include the majority of the sites.

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Table-2 Geo heritage rock sites in Hyderabad

S.No	Geosites	Locations
1	Bear's Nose	inside Shilparamam, Madhapur
2	Cliff Rock	Jubilee Hills
3	Hillocks around DurgamCheruvu Lake	Jubilee Hills
4	Monster Rock	near Film Nagar Jubilee Hills
5	Obelisk	Jubilee Hills
6	Mushroom Rock	inside the University of Hyderabad Campus
7	Rock Park	Old Bombay Road near Dargah Hussain Shah Wali
8	Sentinel Rock	near Moula-Ali
9	Rocks at Maula Ali's Dargah	Moula-Ali
10	Toadstool	next to Blue Cross, Jubilee Hills

Source: <https://heritage.telangana.gov.in/monuments-in-telangana/hyderabad>

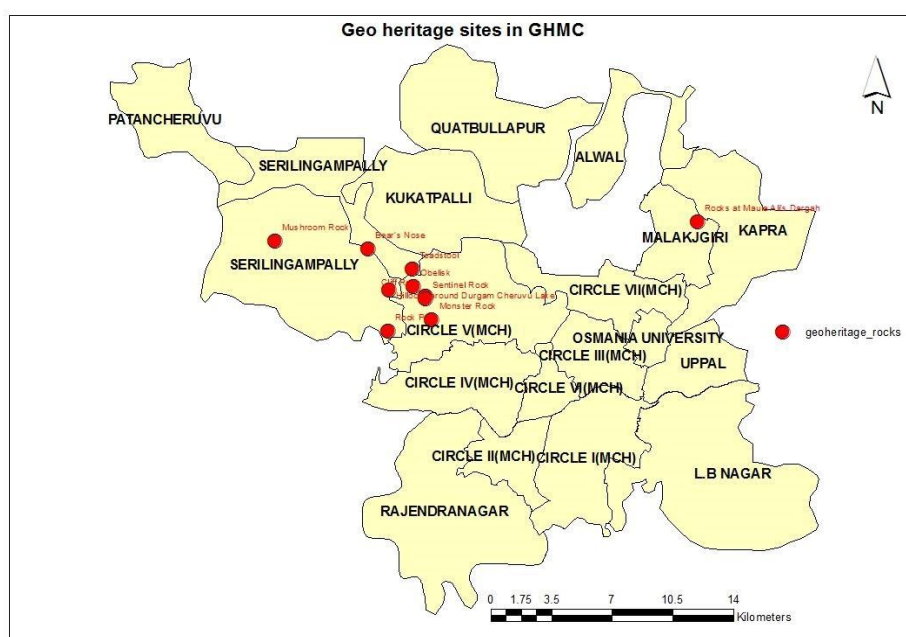


Figure. 2 Geo heritage rock sites in Hyderabad

Source: <https://heritage.telangana.gov.in/monuments-in-telangana/hyderabad>

Table-3 Worldwide some of the agencies of geo-heritage conservation

S.No	Name of agency/ body in charge of geoheritage conservation	Country
1	Ministry of Land and Resources	china
2	ministry of Environment	Czech Republic, Iceland, Korea
3	Ministry of Economy, Trade and Industry	Japan
4	Australian Capital Territory Heritage Council	Australia
5	Canadian National Committee for Geo parks	Canada
6	Czech Environmental Inspection Agency	Czech Republic
7	Egyptian Environmental Affairs Agency	Egypt
8	The Heritage Council	Ireland
9	Italian National Geo parks Forum	Italy
10	Central Environmental Council	Japan
11	Directorate for Nature Management	Norway
12	Department of Environment and Natural Resources	Philippines

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13	Central Environmental Protection Authority	Romania
14	South African Heritage Resources Agency	South Africa
15	Pro GEO-The European Association for the Conservation of the Geological Heritage	United Kingdom
16	Conservation and Geo tourism Committee of Geological Society of South Africa	South Africa
17	Commission of Geological Heritage of Geological Society	Spain
18	Geo conservation Commission of the Geological Society of London	United Kingdom
19	Commission on Geo heritage of International Geographical Union	South Africa
20	Joint Nature Conservation Commission	United Kingdom
21	Natural England	United Kingdom

Source: https://www.geographyandyou.com/wp-content/uploads/2019/12/136-GnY-1-30-July 2019_Geoheritage

Some of the organisations that work to conserve geo-heritage locations both domestically and internationally are included in the table above. These organisations were founded in the early 1970s and 1980s primarily to preserve heritage sites and earth science research. Funds for the establishment of new historic sites in emerging and impoverished nations must be provided by rich nations. A new degree of possibilities for the development of cultural heritage in underdeveloped nations has been made possible by technology. The national and provincial governments are taking the lead in managing national resources (heritage sites) and provide funding for heritage sites' upkeep. The preservation of the heritage sites is being handled by national and international organisations.

According to corporate social responsibility (CSR), businesses should provide money to various sectors. If they are donating to heritage sites and other geoheritage sites, it would be preferable to create new geo-sites and preserve the existing ones. The above table lists the international organisations that, in line with their objectives, are working on different geoheritage sites.

CONCLUSION

History needs to be maintained with specific evidence in certain geo-historic places in order to be understood by both domestic and foreign tourists. Both the national and state governments should pass laws to protect geo-heritage sites and rocks that provide geological proof of the formation of the earth. The preservation of geo-heritage and geobiodiversity is essential to preserving nature as urbanization erodes rocks and landforms. Future generations will find educational and scientific value in its preservation. In order to learn about the history of these places, there has to be a strong focus on geohistorical research, local site identification, geoheritage location nominations worldwide, and the creation of maps of these sites on a local and national level.

By providing infrastructure and other facilities, supporting prospective geo-historical places can contribute to the development of local economies and tourism. Working with national and international institutions is necessary to manage and develop geo-historic sites in the future. Involvement of the general public and corporate sector in the promotion of geo sites from bodies like UNESCO in order to identify and improve the development of geo sites in compliance with international standards. The establishment and promotion of India's geo-heritage sites would require the significant research initiatives, research works, and scholarly contributions from various universities and individuals. The research needs to look at local site identification and how it relates to heritage and cultural significance going forward.

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