

Public open spaces and geotourism development in Pokhara metropolitan city, Nepal

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Abstract: Public open spaces (POS) are an integral part of the built-up area. They provide a platform for local as well as foreign visitors for recreation, socialization, and stimulation in a diverse environment. POS is a site with unique and attractive geological, geomorphological, landscape and socio-cultural environments are used for geotourism development. This paper discusses the development of geotourism in public open spaces in Pokhara Metropolitan City (PMC) and analyzes the perception of visitors towards the provisions of the particular POS. This study has applied an exploratory research design while primary information was obtained from a field observation with a checklist and patch visitors' related records from POS. Similarly, visitors' opinions were obtained through a structured questionnaire. Out of 277 public open spaces so far mapped in PMC, more than 70 patches have a potential for geotourism development and, 18 public open spaces are developed as sites of geotourism. However, only seven of them are managed systematically with the provision of formal institutions collecting revenue from visitors' entry fees. Regarding the visitor's satisfaction towards the development and facilities, about 23% of visitors are highly satisfied and another 38% are satisfied. Patches described as highly satisfied are more developed and have more visitors. The annual revenue of these seven POS also confirms that proper development of other POS as geotourism destinations, will further contribute to the economic prosperity of PMC. Moreover, its surrounding areas will have higher prospects of developing as global geopark.

Keywords: geotourism, public open space, Pokhara, recreation, revenue

Introduction

Public open space refers to the places that are available to urban residents, city service users and tourists for recreation as well as social, economic, cultural, political, activities without restrictions (UN-Habitat, 2018). These spaces, intentionally designated for public use, serve multifaceted purposes ranging from recreation and relaxation to environmental conservation and cultural enrichment (Blaikie, 2000; Francis, 2003; Özgüner & Kendle, 2006; Balogh & Takács, 2011; Gehl, 2011; Alle, 2012). Public open spaces also enhance sense of community in urban capital (Carmona *et al.*, 2010; Carmona & Wunderlich, 2013; Chitrakar, 2016). The accessibility and communal nature of POS contribute to the development and socialization of urbanities, promote physical and mental

health, and contribute to the cultural and recreational network of a locality. In addition, it is also very important for disaster risk management (Allan & Bryant, 2010). Thus, POS provide several opportunities: mental and physical wellbeing, public functions, leisure activities, religious, political, and cultural programs, as well as several recreational activities (Zukin, 1995; Ward Thompson, 2002). Leiper (1995) stated that, tourism is a special form of leisure, and the open spaces on trips away from home provide a dimension beyond everyday entertainment. Tourism is also a sustainable source of income generation where money is transferred from visitors to local places (Klaiber & Phaneuf, 2010; Upadhyay, 2019).

Kaplan (1985) emphasizes that environmental preferences significantly shape how spaces are emotionally and cognitively perceived and experienced. Das (2013) suggests that

reclaiming and integrating public open spaces is essential to counteract the pressures of privatization and fragmented urban growth, fostering a more community-centered city. Furthermore, visitors' perceptions and experiences of public open spaces reveal that environmental quality, accessibility, and cultural significance play a key role in shaping user satisfaction (Pokharel, 2020). The provision and development of open space help to improve the quality of life in the neighborhood and improve urbanities health (Vienna! ahead. Urban Development, City of Vienna, n.d.; Kaplan, 2001; Villanueva *et al.*, 2015). These public open spaces, often in the form of parks, gardens, waterfronts, caves, viewpoints and other accessible areas, serve as important attractions that entice tourists and offer numerous benefits to both visitors and local communities.

Geotourism is a type of tourism that is either geological or geographical in orientation and takes place where geology, geomorphology, landscape, environment, culture, aesthetics, heritage features are considered tourist attractions (Newsome & Dowling, 2010; Arouca Declaration, 2011; Dowling, 2013; Xu & Wu, 2022). As mentioned above, it flourishes as a significant source of income that can be utilized for the sustainable development of the sites. Geotourism, which focuses on promoting tourism that sustains or enhances the geographical character of a patch, can be a powerful destination for revenue generation. The existing trend of visitors' data articulate essential context for understanding the dynamics of tourism in POS. These patches play a crucial role in shaping the visitor experience and contributing to tourism.

There are many public open spaces with unique and attractive geological, geomorphological, landscape with high aesthetic value, environmental and socio-cultural attributes in PMC. This paper discusses the types of open spaces in terms of tourism attraction and its utilization, flow of tourism, revenue generation from tourism and prospects for developing geotourism and also geoparks in Pokhara Valley.

Methodology

Study area

This study area is Pokhara Metropolitan City (PMC), which is a naturally blessed city, nestled in the mid-hill valley of Nepal, at the lap of Mount Fishtail and Mount Annapurna. Every corner of the PMC has a natural viewpoint for the rapturous glimpses of the mountain scenery and enjoys the pleasant climatic conditions prevalent in the Pokhara city. The geographical location of PMC is 28°07'51" to 28°19'41" N, and 83°51'32" to 84°03'37" E longitude and its elevation is in the range of 505 m (Kotre) to 2,470 m (Panchase Hill). The surface area of covers 464.24 km². The view of high Himalayan peaks such as Dhulagiri, Macchapuchhre, and Annapurna in its northern part, the existence of lakes such as Phewa, Rupa, Begnas, karst topography with several caves and gorges, large scale glacio-fluvial deposits in Pokhara Valley constitute some elements of geology, geomorphology, landscape and environment with unique and attractive values (Fig. 1 and 2).

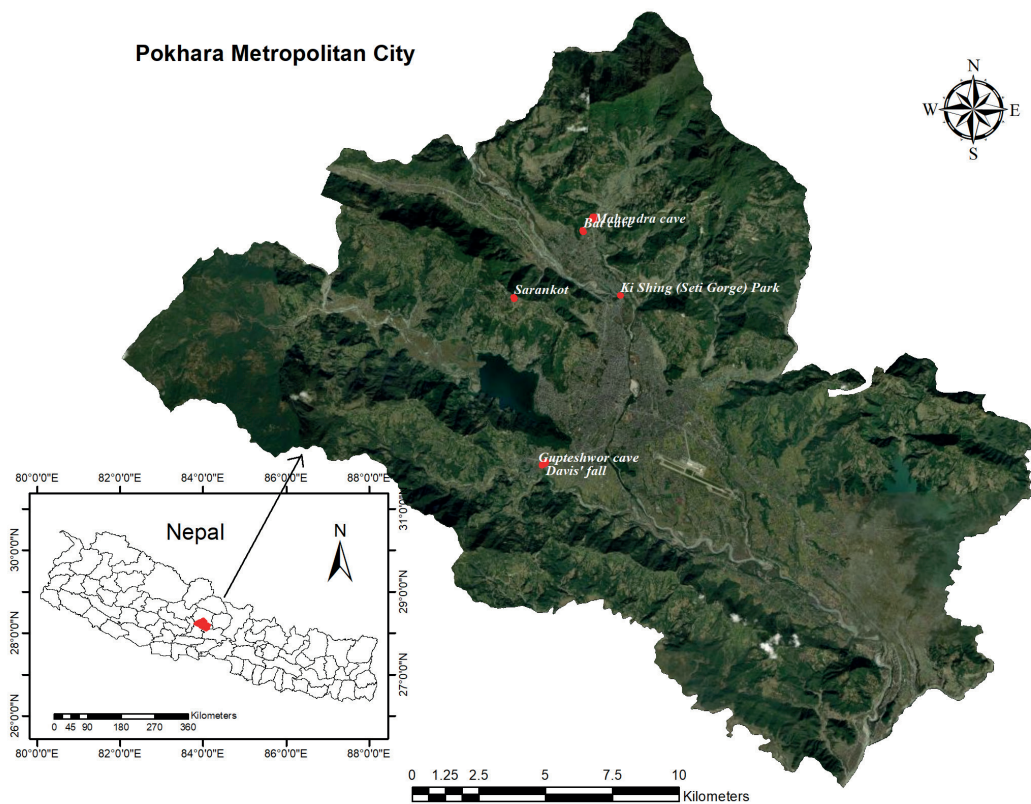


Fig. 1. Location of Pokhara Metropolitan City (PMC) and selected public open spaces (POS)

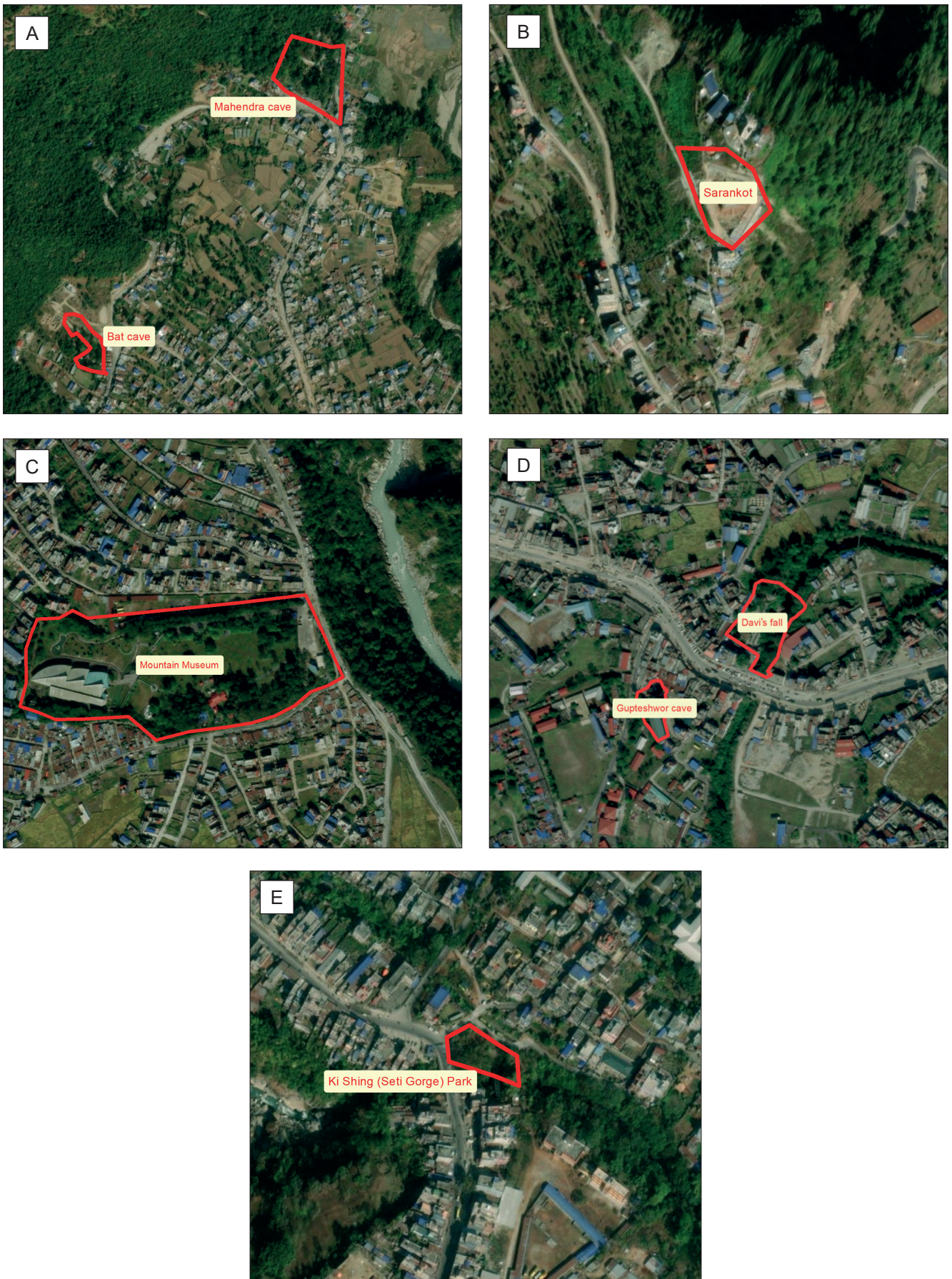


Fig. 2. Location of selected public open spaces (POS) in PMC: A – Mahendra Cave and Bat Cave; B – Sarankot; C – Mountain Museum; D – Davi's Fall and Gupteshwor Cave; E – KI Singh (Seti Gorge) Park

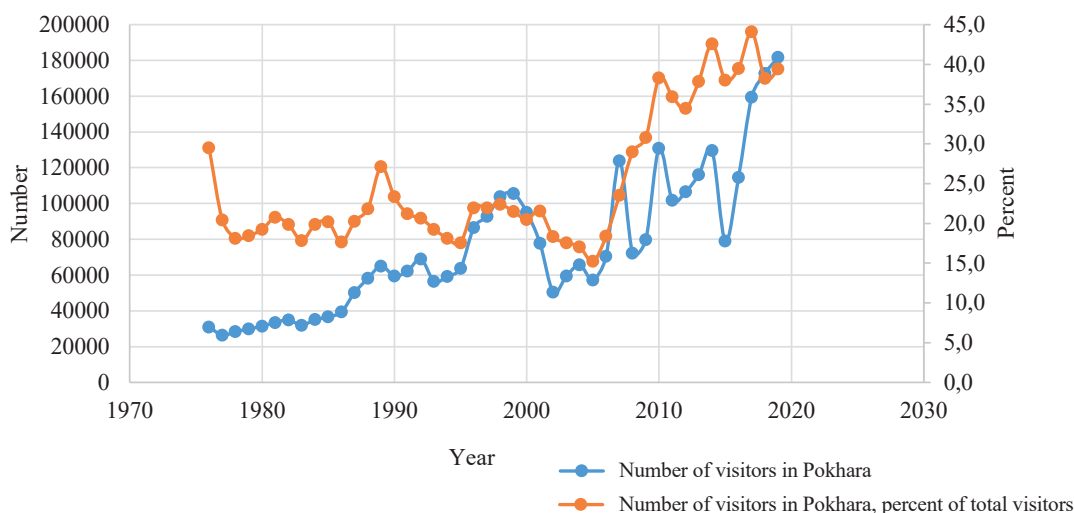


Fig. 3. Annual number of visitors in Pokhara 1976–2010 (Ghimire, 2016) and the number of visitors projected from year 2010 to 2020 (before COVID-19 pandemic)

It is naturally beautiful and delightful, culturally adorned and graceful so it has become a major destination for international as well as domestic tourists. Pokhara is a major destination of international as well as domestic tourist. Figure 3 shows the arrivals of international tourists between 1976 and 2010, and values projected for the period of 2011–2020 in Pokhara. It also shows that nearly 45% of the total foreign tourist visiting the country visit the Pokhara Metropolitan City.

Study design

In this study, step-by-step process presented in Figure 4 was adopted. This is an exploratory type of study using information from both primary and secondary sources.

At the first stage, all the open spaces (277 and covering area of 2,574 ha) were mapped and information on their characteristics was collected from the field observation by using a checklist.

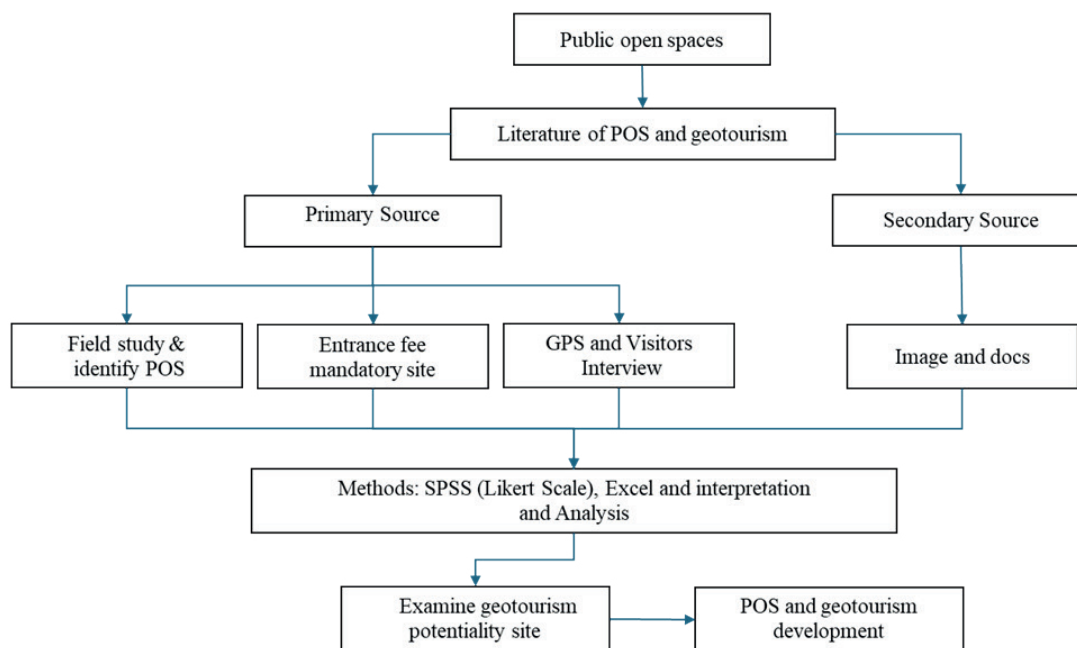


Fig. 4. Conceptual framework of methodology

Site selection

The study focused on identifying POS with high attraction value based on key attributes such as geology, geomorphology, landscape, environmental conditions, and cultural significance. These sites were identified as either currently developed for geotourism or possessing strong potential for future development. From this analysis, seven specific sites were selected for detailed study. The selection criteria were based on the availability of reliable data regarding visitor numbers and revenue generated through mandatory entry fees at each location.

Data collection

Both primary and secondary data sources were utilized in this study. Primary data were collected through field surveys and direct interviews with tourist visitors at the selected sites. Secondary data, including daily records of local and foreign tourist visits and revenue generated from entry fees, were obtained from the respective administrative offices of each POS.

An inventory map of open spaces was also prepared as part of the data collection process. This was achieved through a combination of field observations, geographic data from the Survey Department of Nepal, satellite imagery from Google Earth Pro 2023 (Landsat/Copernicus), and GPS mapping.

The primary data collection was limited to the seven POS located within the PMC, where entry fees are mandatory for all visitors. These seven sites are recognized as major geotourism destinations, receiving an estimated 2,000 to 5,500 domestic and international tourists per day. This high visitation rate underscores the importance of these sites within the regional tourism landscape and provides a robust basis for assessing visitor satisfaction and service quality.

Sampling method

A random sampling method was employed to select tourist visitors for the survey at each of the seven POS. This approach ensured that each visitor had an equal chance of being included in the sample, thereby enhancing the representativeness and reliability of the collected data. The interviews aimed to capture visitor perceptions regarding the quality of facilities, services, and overall visitor experience at these sites. Approximately 6,500 national and international visitors visit these sites on a daily basis, including around 2,000 foreign tourists. From this group of foreign visitors, a sample of 215 individuals was randomly selected for the study. Data were collected through a structured questionnaire survey, designed to assess tourist perceptions of the POS. The questionnaire focused on eight key parameters: accessibility, natural and cultural attractions, sanitation, internal management, safety, surrounding environment, and parking facilities.

Data analysis

For the analysis of collected data, SPSS software was used to describe and interpret the characteristics of tourist visitors' experiences with the existing facilities at the selected POS. The level of visitor perception was assessed across eight key parameters using a five-point Likert scale, where '5' represented highly satisfied, '4' – fairly satisfied, '3' – neutral, '2' – less satisfied, and '1' – dissatisfied. In this scale, the mean value of '3' was considered the midpoint, indicating a neutral perception.

Ratings of '4' and '5' were interpreted as indicators of high visitor satisfaction, suggesting that the site is popular and attractive, which is likely to contribute positively to tourism promotion and development. The collected data were further analyzed and presented through figures, charts, photographs, and tables, with the assistance of SPSS and ArcGIS 10.8 software for spatial and statistical visualization.

Results and discussion

Number of POS in PMC

There are 277 patches of POS in PMC with variable spatial and attribute configurations. Majority of these patches (55%) are located in plain areas, 41% in sloppy areas, and 4% are localized in karst areas (caves). Regarding the environmental aspects: 13% of the all patches are covered by dense vegetation, while 22% are covered by thin vegetation, 7% are decorated by gardening, 2% are wet lands and the remaining 56% constitute gray surfaces. Among them 34% of the all patches have a diverse and attractive landscape. In general, there are eight major typologies of POS in PMC, such as: parks, playgrounds, religious sites, water surfaces, viewpoints, caves, river strips, and distinct spaces (Pokharel & Khanal, 2018)

PMC is a gorgeous place due to its mountain range as well as its variable geology and geomorphology structure. Due to the diversification of spatial and attribute configurations, these patches can be clustered into four categories, such as: geological, geomorphological/landscape, environmental, and cultural points of view (Tab. 1).

The findings from the field study (2023) indicate that geologically and geomorphologically attractive sites account for approximately 69% of the total area, comprising 74 distinct patches. Despite their larger spatial coverage, these sites receive only about 35% of the total daily visitors. In contrast, the remaining 207 patches, which cover only 31% of the area, attract a relatively higher proportion of visitors, approximately 42% per day. This distribution suggests that while geological and geomorphological landscapes represent a significant portion of the physical environment, their current utilization for tourism is comparatively lower than other types of sites.

Table 1. Geotourism categories of POS (field study from 2023; Pokharel & Khanal, 2018)

Categories	Number of patches	Covered area [ha]	Covered area [%]	Visitors per day	Visitors per day [%]
Culture	183	198.330	7.70	21,285	60.54
Environment	20	607.323	23.58	1,355	3.85
Geology	10	3.660	0.14	3,105	8.83
Geomorphology	64	1765.905	68.57	9,415	26.78
Grand total	277	2575.227	100.00	35,160	100.00

POS with geotourism development

In the PMC, a total of 277 POS have been identified. Among these, 70 patches are recognized as having significant potential for geotourism development, based on their geological, geographical, landscape, environmental, and cultural values, as well as their capacity to offer recreational experiences.

Of these 70 potential geotourism sites, 18 sites are currently under development and actively attract a substantial number of visitors. These developed sites receive more than 13,550 visitors per day, with many tourists specifically engaging with and appreciating their geological and

geomorphological features and attractions. This highlights the growing importance of geological landscapes as key assets for tourism promotion and sustainable geotourism development within the PMC (Tab. 2).

As previously discussed by Gilbert & Landsem (2023), seven POS sites have been identified as key locations for geotourism development, underscoring the potential for recognizing Pokhara as a recognizing for designation as a global geopark. These seven patches include the World Peace Pagoda, Phewa Lake, Barahi Temple, Seti Gorge, Davi’s Fall, Gupteshwor Cave, Mahendra Cave, and the Annapurna Museum and International Mountain Museum.

Table 2. Attribute and attraction of geotourism in the POS (field study from 2023)

S.n.	POS name	Area [ha]	Attributes of attraction	Visitors per day
1	Phewa lake	423.868	scenic beauty, mountain image reflection, sunset views, recreational activities	2,000
2	Begnas Lake	305.266	scenic beauty, fishing, boating, sunset view	500
3	World Botanical Garden	165.528	native and colorful plants, conservational site, recreational site	150
4	Phewa Wetland	161.166	diverse vegetation, ecological significance	100
5	Pokhara zoological park	134.281	diversity animal exhibition, conservation and education	100
6	Rupa Lake	108.922	scenic beauty, fishing, boating	100
7	Ramghata	19.526	opening of Seti Gorge and fantastic view of glacio-fluvial depositional landform, conglomerate material, holy bathing place, cemetery	350
8	Kahun viewpoint	2.305	scenic, panoramic view of mountains, sun rise and sunset views	100
9	Mahendra Cave	1.211	Karst topography, geologically scenic landscape, gardening premises, recreational site	1,000
10	Mountain Museum park	3.3441	culture, geography, geology and mountain history, mountain artifact, mountain people information	540
11	Pokhara Stadium	19.636	sports facilities, multipurpose uses, recreational site, cultural exhibition	2,700

Table 2 cont.

12	Sarankot viewpoint area	0.641	scenic beauty of Himalayas, hills and valley, sun rise and sunset views, attractive landscapes	290
13	Davi's fall	0.537	interesting land scape, waterfall, connection with natural tunnel, photography site	2,000
14	Bat Cave	0.358	bat habitat, ecological significance, karst topography, geological features	560
15	Seti Gorge Park	0.158	interesting geography and geological landscape, deep gorge of river, adventure site	260
16	Gupteshwor Cave	0.155	Karst topography, religious and adventure site	1,500
17	World Peace Pagoda	1.902	spiritual and cultural essence, viewpoint, Buddish symbolism	800
18	Talbarahi Temple	0.261	unique geographical location, island, religious place	525

Major POS with geotourism development and managed by formal institutions

These seven major POS sites, identified for geotourism development, are managed by formal institutions responsible for the administration and maintenance of each location. These management bodies are engaged in key activities such as record-keeping of visitor numbers, collection of entry fees, and the overall site management and preservation. The selected sites include Davi's Fall, Gupteshwor Cave, Mahendra Cave, International Mountain Museum, Sarankot viewpoint, KI Singh Park (Seti Gorge), and the Bat Cave. A brief overview of the geological and geographically diverse characteristics of these sites is presented below to highlight their significance for geotourism within the Pokhara metropolitan city.

Davi's Fall

Davi's Fall, locally known as Patale Chango, is recognized for its distinctive natural features, combining geological significance with recreational value. Located in Pokhara, this site is renowned for its underground tunnel system and the dramatic cascade of water that creates a visually striking and immersive experience for visitors (Fig. 5A). The surrounding landscape further enhances the site's appeal, offering a serene and picturesque environment that contributes to its popularity as a geotourism destination (Fig. 5B). Visitor trend analysis for Davi's Fall, presented in Figure 6, shows fluctuations in tourist arrivals over the past six years. A significant decline in visitor numbers was observed during the COVID-19 pandemic period, whereas a steady increase in arrivals occurred in the subsequent years, reflecting the site's sustained attraction to both domestic and international tourists.



Fig. 5. Views of Davi's Fall, a prominent geotourism site in Pokhara: A – the underground water plunge at the main Davi's Fall site; B – the adjacent landscaped park area designed for recreation and visitor relaxation

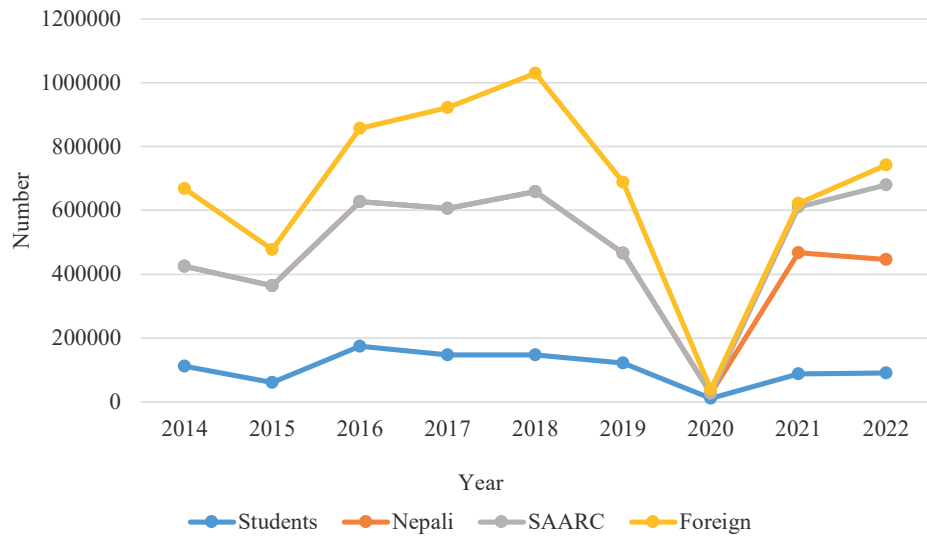


Fig. 6. Visitors' trend in Davi's Fall (Chhorepatan Secondary School Office, 2023)

The site's natural beauty and unique geological features appear to play a central role in maintaining high visitor interest and supporting local economic development. In 2022 alone, Davi's Fall recorded 741,903 tourist visits, generating approximately 40.9 million Nepalese rupees in revenue.

The site is managed by the Cave Management Committee, which allocates the collected funds toward the operation of Chhorepatan Secondary School and various community welfare programs, demonstrating a model of tourism revenue reinvestment for social development.

Gupteshwor Cave

Gupteshwor Cave, located in Pokhara, is renowned for both its religious significance and its remarkable geological

formations. The cave features an extensive display of limestone structures, including well-developed stalactites and stalagmites, which have formed over thousands of years through natural geological processes (Fig. 7). In addition to its internal geological features, the surrounding landscape enhances the site's appeal, offering scenic views and a tranquil natural environment that provides visitors with a sense of peace and spiritual reflection.

Gupteshwor Cave serves a dual role as both a site of religious pilgrimage and a geotourism attraction, appealing to visitors interested in cultural heritage as well as natural wonders. This combination of spiritual importance and geological uniqueness makes the site a key destination for tourists seeking meaningful and immersive experiences.



Fig. 7. Interior and exterior views of Gupteshwor Cave: A – inside the cave: limestone formations and spiritual offerings highlight its dual significance in geology and pilgrimage; B – the architecturally striking staircase leading to the cave entrance

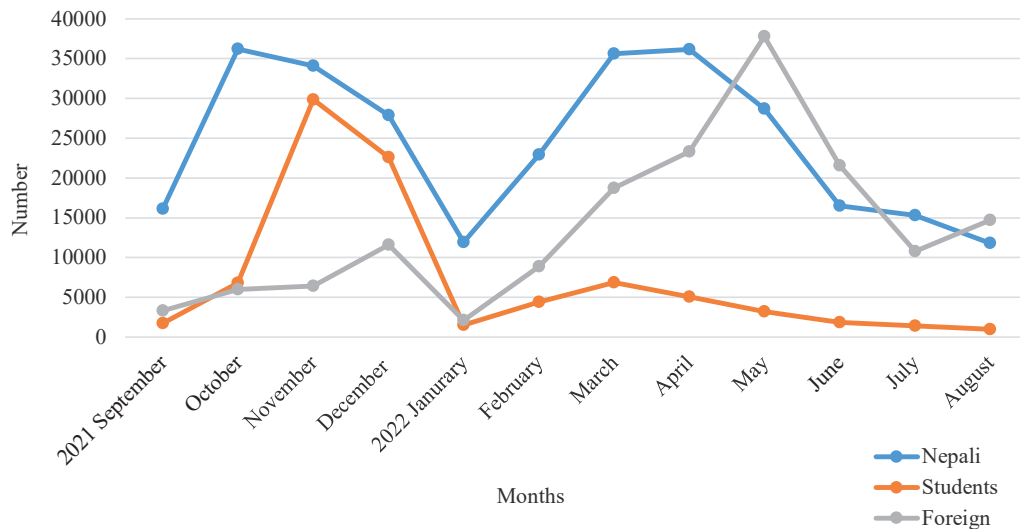


Fig. 8. Monthly visitors' arrival trend in Gupteshwor Cave, Pokhara (September 2021 – August 2022)

Visitor trend data illustrated in Figure 8. indicates that between September 2021 and August 2022, 544,734 visitors were recorded at the site. Monthly visitation patterns show peaks during the periods of March–April and October–November, while lower visitor numbers were observed during January–February. Furthermore, the site's annual revenue has shown a positive recovery after the COVID-19 pandemic, with approximately 34 million Nepalese rupees generated in 2022.

The site is managed by the Gupteshwor Cave Management Committee, which utilizes the collected revenue to support the operation of Gupteshwor Campus and to fund various community welfare initiatives, contributing to local socio-economic development through sustainable tourism practices.

Mahendra Cave

Mahendra Cave, located in Pokhara, offers a distinctive experience for visitors interested in exploring the marvels of subterranean geological formations. Known for its underground limestone structures, the cave presents a unique blend of adventure, natural beauty, and tranquility, making it a prominent destination for both domestic and international tourists (Fig. 9).

The area surrounding the cave is characterized by scenic landscapes, offering panoramic views of nearby mountains and valleys, which further enhance its claim, particularly for nature enthusiasts and photographers. This combination of geological significance and aesthetic beauty attracts a diverse group of visitors, including tourists, local residents, and adventure seekers (Fig. 10).



Fig. 9. Entrance and surrounding landscape of Mahendra Cave: A – the natural rock entrance of Mahendra Cave; B – the landscaped area and guiding signage leading to the cave, illustrating visitor access and the integration of tourism infrastructure

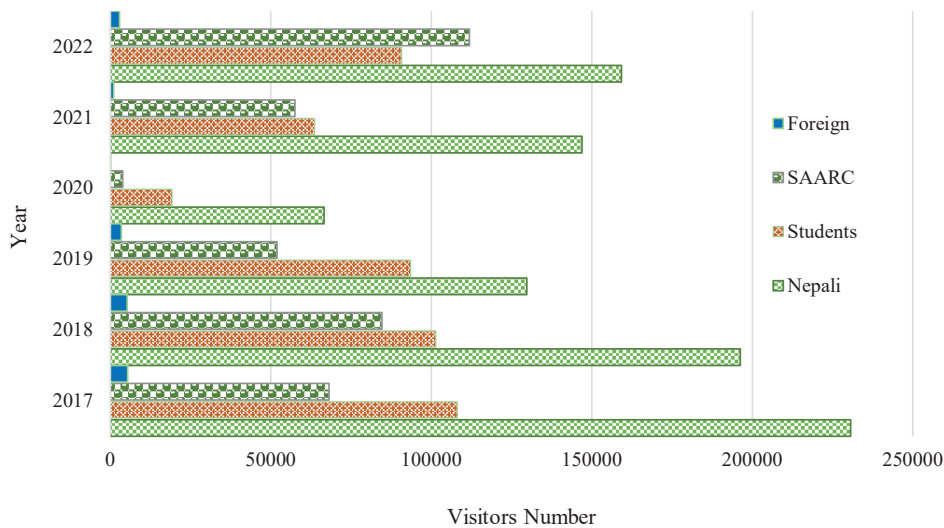


Fig. 10. Visitors' arrival trend in Mahendra Cave (Mahendra Cave & Bat Cave Office, 2023)

Visitor data, illustrated in Figure 10, shows fluctuations in tourist arrivals over the years. In 2017, the site recorded approximately 230,000 visitors. Although there was a notable decline in tourist numbers during the COVID-19 pandemic, post-pandemic trends indicate a gradual recovery and increase in visitor arrivals. In 2022, Mahendra Cave generated about 20 million Nepalese rupees in revenue, highlighting its economic contribution to the region.

These sites are jointly managed by the Mahendra Cave and Bat Cave Management Committee, with the revenue collected being allocated toward the operation of Vindwasini Secondary School and various community welfare programs. This model of reinvesting tourism income into education and local development reflects the site's role in promoting sustainable tourism practices within the area.

Mountain Museum

The International Mountain Museum is a renowned institution that highlights the history, culture, and significance of the world's mountainous regions, with a particular focus on the Himalayas. The museum aims to preserve and promote the diverse aspects of mountain life, culture, and mountaineering history. It serves as an educational and cultural center, offering insights into the challenges and triumphs associated with mountain environments (Fig. 11). The International Mountain Museum houses exhibits that document the history of mountaineering, showcasing artifacts, photographs, and narratives of renowned climbers and their expeditions across the Himalayas. Visitors have the opportunity to explore the cultural heritage of mountain communities, including their traditions, lifestyles, and the spiritual significance attributed to the mountains.



Fig. 11. Outdoor scenes at the International Mountain Museum: A – students gathered on the museum lawn during an educational visit; B – distant view of the museum's landscaped surroundings and entrance area, showcasing its integration with the natural environment

Table 3. International Mountain Museum visitors' numbers and revenue (International Mountain Museum Office, 2024)

Fiscal year	Do not collect the entry fee from these types of visitors		Collect the entry fee from these visitors						
	children & others	outside garden visitors	students	Nepalese	resident	SAARC countries	foreign	total visitors	total revenue [RS*]
2014	8,763	981	65,445	53,949	0	18,100	24,650	171,888	14,185,473
2015	7,987	838	75,392	56,826	0	13,819	23,428	178,290	19,713,520
2016	5,635	2,131	47,764	60,682	0	6,620	12,582	135,414	13,164,540
2017	12,149	2,061	108,299	86,589	0	19,287	23,639	252,024	24,613,300
2018	11,594	2,805	99,599	92,813	0	26,770	27,673	261,254	27,888,300
2019	10,472	3,738	97,930	96,666	321	29,281	31,230	269,638	37,690,740
2020	7,041	2,896	85,752	58,399	170	15,215	20,243	189,716	24,182,130
2021	1,408	1,278	13,339	28,256	68	1,023	230	45,602	3,918,640
2022	4,702	2,676	58,651	50,542	96	16,533	4,284	137,484	14,366,280
2023	8,387	2,935	88,051	54,201	182	27,856	16,387	197,999	25,113,700

* RS – Nepalese rupees

The museum also regularly organizes educational programs, workshops, and events focused on mountain culture, conservation, and related topics.

As one of the major tourist attractions in Pokhara (Tab. 3), the museum recorded 197,999 visitors during the 2023 fiscal year, generating approximately 25.1 million Nepalese rupees in revenue. Being part of the Nepal Mountaineering Association, the museum utilizes its income primarily for its own management, maintenance, and operational activities, supporting the continued preservation and promotion of mountain heritage.

Table 3 shows that, over the past ten years, tourist arrivals have generally continued high, with the exception of 2021. The availability of open spaces appears to have played a significant role in attracting tourists and contributing to increased revenue. Although the number of visitors declined during the COVID-19 pandemic, recent years have shown a notable recovery in tourist arrivals, supported by the diverse recreational experiences offered to visitors.

Sarangkot viewpoint

Sarangkot Viewpoint stands out as a prominent destination for travelers seeking awe-inspiring mountain views. The site is renowned for its breathtaking panoramic views of the Annapurna mountain range, including iconic peaks such as Annapurna, Machhapuchhre, and Dhaulagiri, along with scenic views of the Pokhara Valley (Fig. 12).

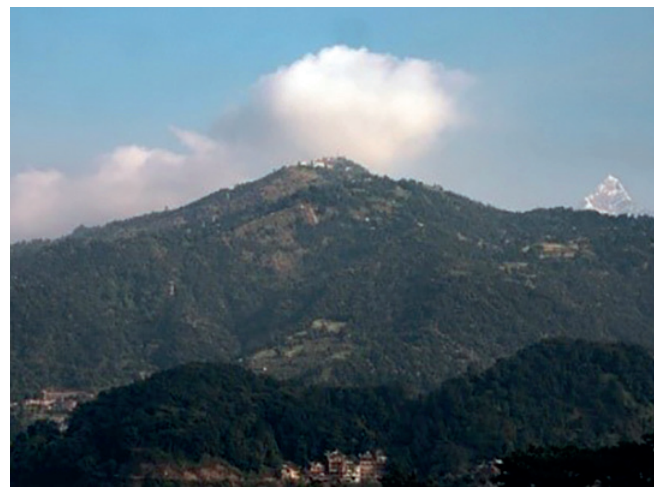


Fig. 12. Panoramic view from Sarangkot viewpoint

Table 4. Annual visitors in Sarangkot viewpoint (Sarangkot View-tour Office, 2023)

Year	Nepalese	Foreign	Total
2021	12,500	7,600	20,100
2022	34,700	21,300	56,000
2023	65,000	41,000	106,000

Table 4 shows that, over the three last years, tourist arrival in Sarankot. In addition to its outdoor attractions, Sarankot offers a peaceful and serene environment, enhancing its appeal as a destination for both adventure seekers and those looking for relaxation. Due to its attractive topographical features, the site recorded 106,000 visitors in 2023, generating approximately 5.3 million Nepalese rupees in revenue. The Sarankot View Tower Management Committee is responsible for collecting entry fees and managing the site. The committee into the maintenance and development of local facilities and infrastructure, supporting the sustainable management of the area, reinvests the funds generated.

Bat Cave

The Bat Cave, also known as Chamere Gupha, is a fascinating underground attraction located in Pokhara. The cave reflects the prominent feature that sets it apart from other caves (Fig. 13). Visitors to the Bat cave can embark on a thrilling adventure as they venture into the depths of the cave to witness the remarkable sight of the bats roosting and flying within the cavern. The experience of observing the bats in their natural habitat is both educational and awe-inspiring, offering a rare opportunity to observe these attractive creatures up close. The cave itself boasts impressive geological formations, including stalactites and stalagmites, which add to the allure of this subterranean wonder.

Table 5 illustrates the annual trends in tourist arrivals at the Bat Cave following the COVID-19 pandemic. In the



Fig. 13. Interior of the Bat Cave (Chamere Gufa) in Pokhara, showcasing dense clusters of bats along the cave ceiling

most recent year, 205,288 visitors were recorded, generating approximately 10.4 million Nepalese rupees in revenue. The table also reflects a steady recovery and

The management of the Bat Cave operates under the Mahendra Cave and Bat Cave Management Committee, with the generated revenue allocated toward site maintenance and the support of local community initiatives, ensuring the sustainability of the site as a key geotourism attraction.

Table 5. Annual visitors in the Bat Cave (Mahendra Cave & Bat Cave Office, 2023)

Year	Nepalese	Students	SAARC countries	Foreign	Total visitors
2021	6,296	19,041	14,179	1,514	41,030
2022	54,000	40,000	26,500	1,770	110,000
2023	102,632	61,535	38,680	2,441	205,288

KI Singh (Seti Gorge) Park

KI Singh Park is a charming and picturesque park located on the bank of the Seti River gorge. It is a beloved site among locals and tourists alike and is regulated under the PMC. Greenery patches, a deep river course, the stimulating sight of the Seti River bring a delightful natural experience for all who visit there (Fig. 14).

Table 6 show the annual visitors are increasing in this site and that is a reason why it generated 2.8 million rupees in 2022 from the 960,00 visitors. The collected funds from this park, which is operated by the Pokhara metropolis, go to the metropolis.

By combining all public open spaces, the total visitor count in 2022 was 225,672,1 contributing to a total income

of NRs 139 million. The majority of visitors were internal tourists, followed by students and foreign tourists, contributing significantly to the overall income generated from these POS.

Table 6. Annual visitors in the KI Singh Park (KI Sing Park Office, 2023)

Year	Nepalese	Foreign	Total visitors
2021	16,000	7,000	23,000
2022	38,500	23,500	62,000
2023	56,640	39,360	9,600



Fig. 14. Views of KI Singh Park situated along the Seti River Gorge in Pokhara: A – garden area with shaded greenery and open space; B – pedestrian bridge spanning the Seti River, offering scenic views of the gorge and serving as a major visitor walkway within the park

Infrastructure service facilities available

As geotourism has become a vital component of the local economy, understanding the visiting trends in these POS becomes imperative. Due to the various characteristics of POS and its natural and cultural aesthetic value more people want to visit these sites for different purposes. Regarding the existing development of geotourism sites of POS in PMC the service facilities are different (Tab. 7).

Table 7 provides a brief overview of POS, their land use, and the available infrastructure facilities. Each row corresponds to a specific open space, detailing the types of infrastructure changes and amenities present at the site. For instance, Davi's Fall, as this geotourism site has undergone changes in infrastructure elements, provides amenities such as sheds, footpaths, benches, toilets, parking, children's area, lighting, and drinking water. Additionally, the table represents other geotourism paths, offering a comprehensive picture of their current provisions.

Tourist visitor's perceptions toward the development situation of POS

Out of the 215 POS visitors taken as a testing sample, 22% were foreign and 78% were domestic tourists, of which 45% were women and 55% were men. As for the age structure, 82% of the visitors were between 20 and 60 years old, and 43% have attained higher education. Regarding the occupation, 65% were engaged in different jobs and businesses, while the others were students and unemployed. They have come to these seven POS from different parts of the world. These tourists had different perceptions about the development and management of the existing POS (Tab. 8).

Regarding the perceptions of tourist's about the POS, 58% of visitors were highly satisfied at the Davi's Fall, 66% were satisfied at the Sarangkot viewpoint, and 63.4% said that it was acceptable at the Mountain Museum. However, the data show that 35.5% of KI Singh Park visitors were not

satisfied with the management. Overall, 61.4% of the visitors are satisfied with sites management but the remaining 38.6% of the tourists are not satisfied, therefore, their development should be improved. The well-managed patches provided a high level of positive perceptions, while patches with poor management had low satisfaction. The development and management of these POS can promote tourism, so the stakeholders should take users' perception as feedback, which will be a guideline for further development of POS.

Issues and challenges in geotourism development

The Pokhara Valley, known for its geologically attractive and geographically diverse landscapes, holds significant potential for geotourism development. These sites, characterized by unique natural features, serve as important centers for recreation, education, and tourism. However, several challenges hinder their effective development, expansion, and conservation.

Key challenges identified in the development of geotourism sites include:

- inadequate infrastructure to support growing visitor demands;
- limited distribution of information and absence of dedicated websites or digital platforms for site promotion;
- habitat disruption due to unmanaged tourist activities;
- poor waste management systems leading to environmental degradation;
- lack of public awareness and education regarding the significance of geotourism and conservation;
- insufficient investment in the maintenance, development, and promotion of geotourism sites.

Addressing these challenges is essential to ensure the sustainable growth of geotourism and the preservation of the PMC natural heritage.

Table 7. Internal management of POS (field study from 2023 and POS Management Committee)

Name of open space	Land sue	Road access	Compound	Sheds	Footpath	Benches	Toilet	Parking	Children playing area	Light	Drinking water	Land use plan in Patches
Davi's Fall	○	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓
Gupteshwor Cave	○	✓	✓	✗	✓	✓	✓	✗	✗	✓	✓	✗
Mahendra Cave	○	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓
Mountain Museum	🌳	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bat Cave	○	✓	✓	✗	✓	✓	✓	✗	✗	✓	✓	✗
Sarangkot viewpoint	○	✓	✗	✓	✓	✓	✓	✓	✗	✓	✓	✗
KI Singh (Seti Gorge)	🌳	✓	✓	✗	✓	✓	✓	✗	✗	✗	✗	✓

Note: ○ – open space being utilized for different purposes; 🌳 – greenery space; ✓ – yes; ✗ – no

Table 8. Level of satisfaction of tourist visitors toward the POS (field study from 2023)

POS name	Level of satisfaction					Total
	not satisfactory	less satisfactory	acceptable	fairly satisfactory	very satisfactory	
Davi's Fall	0	1 (3.2)	5 (16.1)	8 (25.8)	17 (54.8)	31
Gupreshwor Cave	0	2 (6.7)	6 (20)	17 (56.7)	5 (16.7)	30
Mahendra Cave	1 (3)	1 (3.0)	3 (9.1)	16 (48.8)	12 (36.4)	33
Mountain Museum	1 (3.3)	0	19 (63.4)	7 (23.3)	3 (10.0)	30
Sarangkot viewpoint	1 (3.3)	2 (6.7)	3 (10.0)	20 (66.7)	4 (13.3)	30
KI Singh Park	2 (6.5)	9 (29.0)	16 (51.6)	3 (9.7)	1 (3.2)	31
Bat Cave	1 (3.3)	5 (16.7)	5 (16.7)	11 (36.7)	8 (26.7)	30
Total	6 (2.8)	20 (9.3)	57 (26.5)	82 (38.1)	50 (23.3)	215 (100)

Conclusions and recommendations

The study highlights those public open spaces (POS) significantly contribute to the aesthetic value and tourism potential of the Pokhara Metropolitan City (PMC). Out of 277 identified POS in the city, more than 70 sites demonstrate potential for geotourism development. However, to date, only 18 sites have been actively developed for this purpose, and among them, only seven POS are managed by formal institutions that facilitate income generation through entry fee collection from visitors. The revenue generated from these sites is primarily allocated toward site maintenance, development, and community welfare initiatives.

The findings of the study reveal that well-managed sites consistently receive positive visitor perceptions, while sites lacking proper management face negative feedback regarding visitor experience. The analysis also indicates that the

number of visitors, revenue generation, and levels of visitor satisfaction are directly influenced by the degree of site development and management quality. Visitor feedback, particularly perceptions of site conditions and services, serves as a crucial input for strategic planning and improvement of geotourism sites. Enhancing visitor experience through systematic site development not only promotes the beautification and sustainability of Pokhara but also strengthens the protection of natural heritage and creates additional income opportunities for local communities.

Given the geological and geographical uniqueness of the Pokhara Valley and its surrounding areas, there exists a strong potential for this region to be recognized as a UNESCO Global Geopark. Achieving this designation would require the integrated development of geodiverse public open spaces, coupled with effective management, conservation, and promotion strategies.

The study recommends that all geologically and geographically significant POS within the PMC should be systematically developed and managed to:

- enhance the visual and environmental quality of the city;
- generate sustainable income through tourism;
- expand Pokhara's geotourism destinations;
- contribute to regional economic development while ensuring environmental protection.

In conclusion, through strategic investment, effective site management, and enhanced public awareness, the Pokhara Valley has the potential to establish itself as a prominent geotourism destination with global recognition. Given the region's exceptional geological and geographical diversity and its rich natural and cultural heritage, there exists a strong prospect for the area to be developed and proposed as a UNESCO Global Geopark, contributing to both sustainable tourism development and the conservation of geoheritage.

Reference

- Allan P. & Bryant M., 2010. *The critical role of open space in earthquake recovery: A case study*. New Zealand Society for Earthquake Engineering (NZSEE) conference (2010, Nueva Zelandia). <https://db.nzsee.org.nz/2010/Paper34.pdf>.
- Alle E., 2012. Spatial, temporal and social dimensions of the landscape influenced by contemporary art. *Science – Future of Lithuania*, 4(2): 176–187. <https://doi.org/10.3846/mla.2012.31>.
- Arouca Declaration, 2011. Arouca, Portugal. www.europeangeoparks.org/?p=223.
- Balogh P.I. & Takács D., 2011. The significance of urban open spaces and green areas in urban property developments. *First International Conference "Horticulture and Landscape Architecture in Transylvania"*, 110–121. http://193.16.218.138/acta-agrenv/Supl2011/11_Balogh.pdf.
- Blaikie N.W.H., 2000. *Designing Social Research: The Logic of Anticipation*. Cambridge: Polity Press.
- Carmona M. & Wunderlich F., 2013. *Capital Spaces: The Multiple Complex Public Spaces of a Global City*. Routledge: London. <https://doi.org/10.4324/9780203118856>.
- Carmona M., Tiesdell S., Heath T. & Oc T., 2010. *Public Places – Urban Spaces: The Dimensions of Urban Design* (Second ed.). Architectural Press: Amsterdam etc.
- Chitrakar R.M., 2016. Meaning of public space and sense of community: The case of new neighborhoods in Kathmandu Valley. *International Journal of Architectural Research*, 10(1): 213–227. <http://doi.org/10.26687/archnet-ijar.v10i1.807>.
- Das P.K., 2013. *Open Mumbai: Re-envisioning The City and Its Open Space*. <https://www.thenatureofcities.com/2013/08/18/open-mumbai-re-envisioning-the-city-and-its-open-spaces> [accessed: 2025.05.13].
- Dowling R.K., 2013. Global geotourism – An emerging form of sustainable tourism. *Czech Journal of Tourism*, 2(2): 59–79. <http://doi.org/10.2478/cjot-2013-0004>.
- Francis M., 2003. *Urban Open Space: Designing for User Needs*. Island Press: Washington, DC.
- Gehl J., 2011. *Life Between Buildings: Using Public Space* (transl. by Koch J.). Island Press: Washington, DC.
- Ghimire D.R. (ed.), 2016. *Nepal tourism statistics 2016*. Government of Nepal, Ministry of Culture, Tourism & Civil Aviation, Evaluation Division, Research & Statistical Section: Kathmandu. <https://www.hotelassociationnepal.org.np/pdf/Nepal%20Tourism%20statistics%202016.pdf>.
- Gilbert C. & Landsem A., 2023. Assessment of the development of geotourism and ecotourism in the Pokhara Valley, Nepal. *Journal of Tourism and Himalayan Adventures*, 5(01): 16–35. <http://doi.org/10.3126/jtha.v5i01.56174>.
- Kaplan R., 1985. The analysis of perception via preference: A strategy for studying how the environment is experienced. *Landscape Planning*, 12(2): 161–176. [https://doi.org/10.1016/0304-3924\(85\)90058-9](https://doi.org/10.1016/0304-3924(85)90058-9).
- Kaplan R., 2001. The nature of the view from home: Psychological benefits. *Environment & Behavior*, 33(4): 507–542. <https://doi.org/10.1177/00139160121973115>.
- Klaiber H.A. & Phaneuf D.J., 2010. Valuing open space in a residential sorting model of the Twin Cities. *Journal of Environmental Economics and Management*, 60(2): 57–77. <https://doi.org/10.1016/j.jeem.2010.05.002>.
- Leiper N., 1995. *Tourism Management*. TAFE Publications: Collingwood, Vic.
- Newsome D. & Dowling, R.K. (eds), 2010. *Geotourism: The Tourism of Geology and Landscape*. Goodfellow Publishers: Oxford.
- Ozguner H. & Kendle A.D., 2006. Public attitudes towards naturalistic versus design landscapes in the city of Sheffield (UK). *Landscape and Urban Planning*, 74(2): 139–157.
- Pokharel R.P., 2020. Visitors' perception and their experience of public open space of Bhadrakali premises in Pokhara, Kaski, Nepal. *Jjis – Janapriya Journal of Interdisciplinary Studies*, 9(1): 159–172. <https://doi.org/10.3126/jjis.v9i1.35285>.
- Pokharel R.P. & Khanal N.R., 2018. Open space: Typology and distribution in Pokhara Lekhnath Metropolitan city. *The Geographical Journal of Nepal*, 11: 25–44.
- UN-Habitat, 2018. *Developing Public Space and Land Values in Cities and Neighborhoods*. Discussion paper. <https://unhabitat.org/sites/default/files/download-manager-files/Discussion%20Paper%20-%20Developing%20Public%20Space%20and%20Land%20Values%20in%20Cities%20and%20Neighbourhoods.pdf>.
- Upadhyay P., 2019. Tourism policy of Nepal and sustainable mountain tourism development in retrospect. *The Gaze: Journal of Tourism and Hospitality*, 10(1): 37–50. <https://doi.org/10.3126/gaze.v10i1.22776>.
- Vienna! ahead. Urban Development, City of Vienna, n.d. *Thematic Concept: Green and Open Spaces*. https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.digital.wienbibliothek.at/download/pdf/4007777.pdf&ved=2ahUKEwjBqq_2lqCNAXUUQIUIHc5WPb0QFnoECCAQAQ&usg=AOvVaw_0RQpOKRdbwLoJOKd-iljEH.
- Villanueva K., Badland H., Hooper P., Koohsri M.J., Mavoja S., Davern M., Roberts R., Goldfeld S. & Giles-Corti B., 2015. Developing indicators of public open space to promote health and wellbeing in communities. *Applied Geography*, 57: 112–119. <https://doi.org/10.1016/j.apgeog.2014.12.003>.
- Xu K. & Wu W., 2022. Geoparks and Geotourism in China: A Sustainable Approach to Geoheritage Conservation and local development – A Review. *Land*, 11(9): 1493. <https://doi.org/10.3390/land11091493>.
- Ward Thompson C., 2002. Urban open space in the 21st century. *Landscape and Urban Planning*, 60(2): 59–72. [https://doi.org/10.1016/S0169-2046\(02\)00059-2](https://doi.org/10.1016/S0169-2046(02)00059-2).
- Zukin S., 1995. *The Cultures of Cities*. Basil Blackwell: Oxford.